

## ELECTRONIC BOOK ALTERNATIVE DELIVERY SYSTEMS

### Related Applications

This application is a continuation-in-part of U.S. Application Serial No. 07/991,074 entitled TELEVISION PROGRAM PACKAGING AND DELIVERY SYSTEM WITH MENU DRIVEN SUBSCRIBER ACCESS, filed December 9, 1992, and U.S. Application Serial No. 08/336,247 entitled ELECTRONIC BOOK SELECTION AND DELIVERY SYSTEM, filed November 7, 1994, and U.S. Application Serial No. 08/160,194 and PCT/ US93/11606 entitled ADVANCED SET-TOP TERMINAL FOR CABLE TELEVISION DELIVERY SYSTEMS, filed December 2, 1993, and U.S. Application Serial No. 08/906,469 entitled REPROGRAMMABLE TERMINAL FOR SUGGESTING PROGRAMS OFFERED ON A TELEVISION PROGRAM DELIVERY SYSTEM, filed August 5, 1997, and U.S. Application Serial No. 09/191,520 entitled DIGITAL BROADCAST PROGRAM ORDERING, filed November 13, 1998. These applications are incorporated by reference herein. Also incorporated by reference are co-pending U.S. Application Serial No. 09/237,827 entitled ELECTRONIC BOOK HAVING LIBRARY CATALOG MENU AND SEARCHING FEATURES, filed January 27, 1999, U.S. Application Serial No. 09/237,828 entitled ELECTRONIC BOOK ELECTRONIC LINKS, filed January 27, 1999, and U.S. Application Serial No. \_\_\_\_\_, entitled ELECTRONIC BOOK ALTERNATIVE DELIVERY METHODS, filed on date herein.

### Background Art

Sparked by the concept of an information superhighway, a revolution will take place in the distribution of books. Not since the introduction of Gutenberg's movable typeset printing has the world stood on the brink of such a revolution in the distribution of text material. The definition of the word "book" will change drastically in the near future. Due to reasons such as security, convenience, cost, and other technical problems, book and magazine publishers are currently only able to distribute their products in paper form. This invention solves the problems encountered by publishers.

## 1 Technical Field And Brief Summary Of Invention

2 The electronic book selection and delivery system is a new way to distribute  
3 books to bookstores, public libraries, schools and consumers. The technological  
4 breakthroughs of this invention provide a secure electronic system for both delivering  
5 selected books and receiving payments. The system has an unusual combination of  
6 features that provides the consumer with a daily use household appliance that has a high  
7 tech aura while being very practical, portable, and easy to use.

8 An advantage of the system is that it eliminates the distribution of any physical  
9 object such as a paper book or computer memory device from any book or text  
10 distribution system. The purchase of a book becomes a PAY-PER-READ™ event  
11 avoiding the overhead, "middle-men," printing costs, and time delay associated with the  
12 current book distribution system. Published material and text such as the President's  
13 speech, a new law, a court decision on abortion, or O.J. Simpson's testimony can be  
14 made immediately available to the consumer at a nominal fee. Alternatively, books may  
15 be made available free to the end use consumer, subsidized by advertisers who sponsor  
16 books or embed advertising within the books.

17 The system is a novel combination of new technology involving the television,  
18 cable, telephone, and computer industries. It utilities high bandwidth data transmissions,  
19 strong security measures, sophisticated digital switching, high resolution visual displays,  
20 novel controls, and user friendly interface software.

21 The primary components of the text delivery system are the subsystem for  
22 preparing the text for delivery and the subsystem for receiving and selecting text that was  
23 delivered. An embodiment of the system includes additional components and optional  
24 features that enhance the system. The system may be configured for use by bookstores,  
25 public libraries, schools and consumers. In one embodiment, the system for consumer  
26 use is made up of four subsystems, namely: (1) an operations center, (2) a distribution  
27 system, (3) a home subsystem including reception, selection, viewing, transacting and  
28 transmission capabilities, and (4) a billing and collection system. Alternative

1 configurations of the system are defined to allow for a variety of traditional and non-  
2 traditional delivery methods.

3 The operations center performs several primary functions: manipulating text data  
4 (including receiving, formatting and storing of text data), security encoding of text,  
5 cataloging of books, providing a messaging center capability, and performing uplink  
6 functions. In one embodiment, the system delivers the text from the operations center to  
7 consumer homes by inserting text data within analog video signals. The insertion of text  
8 is generally performed with an encoder at an uplink site that is within or near the  
9 operations center. The system can use several lines of the Vertical Blanking Interval  
10 (VBI), all the lines of the analog video signal, a digital video signal or unused portions  
11 of bandwidth to transmit text data. Using the VBI delivery method, the top ten or twenty  
12 book titles may be transmitted with video during normal programming utilizing existing  
13 cable or broadcast transmission capability without disruption to the subscriber's video  
14 reception. Using the entire video signal, thousands of books may be transmitted within  
15 just one hour of air time. Nearly any analog or digital video or data distribution system  
16 may be used to deliver the text data. The text data may also be transmitted over other low  
17 and high speed signal paths including a telephone network (e.g., a public switched  
18 telephone network) having a high speed connection such as an asynchronous digital  
19 subscriber line (ADSL) connection and the Internet, for example.

20 The home subsystem performs at least four functions: connecting to the  
21 distribution system, selecting text, storing text, and transacting through a communicating  
22 mechanism. The components of the home subsystem may be configured in a variety of  
23 hardware configurations. Each function may be performed by a separate component, the  
24 components may be integrated, or the capability of existing cable set top converter boxes,  
25 computers, and televisions may be utilized. A connector, library unit and viewer unit  
26 may be used. In one embodiment, the connector portion of the home subsystem receives  
27 an analog video signal and strips or extracts the text from the video. The home library  
28 stores the text signal, provides a user friendly software interface to the system and  
29 processes the transactions at the consumer home. The viewer provides a screen for

viewing text or menus and novel user friendly controls. Alternative embodiments are presented that support delivery of text using a variety of communication mechanisms.

The viewing device may be a portable book shaped viewer which stores one or more books for viewing and provides a screen for interacting with the home library unit. A high resolution LCD display is used to both read the books and to interact with the home library software. In one embodiment, an optional phone connector or return-path cable connection initiates the telephone calls and, with the aid of the library, transmits the necessary data to complete the ordering and billing portion of the consumer transaction. Alternative embodiments are presented that support ordering and billing using a variety of communication mechanisms. The user friendly controls include a bookmark, current book and page turn button. The billing and collection system performs transaction management, authorizations, collections and publisher payments automatically.

A system similar to the system for consumer use may be used in bookstores, schools and public libraries.

#### Brief Description Of Drawings

Figure 1a is a block diagram of the primary components of an electronic book selection and delivery system.

Figure 1b is a block diagram of an electronic book selection and delivery system that uses a composite video signal.

Figure 2 is a schematic showing an overview of the electronic book selection and delivery system.

Figure 3 is a schematic of a delivery plan for the electronic book selection and delivery system.

Figure 4 is a block diagram of the operations center.

Figure 5a is a flow diagram of processing at the operations center and uplink.

Figure 5b is a block diagram of a hardware configuration for an uplink site.

Figure 6a is a block diagram of a hardware configuration for a four component home subsystem.

Figure 6b is a schematic of a two unit home subsystem.

1 Figure 7 is a flow diagram of processes performed by a video connector.

2 Figure 8 is a block diagram for an example of a library unit.

3 Figure 9 is a flow diagram of processes performed by a library unit on the  
4 received data stream.

5 Figure 10 is a flow diagram of processes performed by a library unit on  
6 information requests from a viewer.

7 Figure 11 is a block diagram showing the components for an example of a viewer.

8 Figure 12 is a flow diagram of processes performed by a viewer on an information  
9 request from a subscriber.

10 Figure 13 is a chart depicting a menu structure and sequencing of menus in a  
11 menu system.

12 Figure 14a is a schematic of an introductory menu.

13 Figure 14b is a schematic showing an example of a main menu.

14 Figures 14c, 14d, 14e, 14f, 14g, 14h, 14i and 14j are schematics showing  
15 examples of submenus.

16 Figure 15 is a schematic diagram of an electronic book system for a bookstore or  
17 public library.

18 Figure 16a and Figure 16b are schematics of hardware modifications or upgrades  
19 to a set top converter.

20 Figure 17 is a schematic showing a set top terminal that includes a data receiver  
21 and data transmitter.

22 Figure 18a is a schematic of a book-on-demand system.

23 Figure 18b is a schematic of an operations center supporting a book-on-demand  
24 system.

25 Figure 19 is a diagram of a digital television program environment.

26 Figure 20 is a flowchart of steps involved in processing text at an operations  
27 center.

28 Figures 21a-21g are diagrams of remote location reception options.

1           Figure 22 presents a hardware configuration of a home subsystem used to receive  
2 a program broadcast.

3           Figure 23 is a flowchart of processes performed by a digital television program  
4 connector.

5           Figure 24a – 24c are examples of order systems for use in the broadcast  
6 environment of Figure 19.

7           Figure 25 is a flowchart showing steps associated with ordering over the Internet.

8           Figure 26 is a diagram depicting components used for delivery of electronic books  
9 over the Internet.

10          Figure 27 presents embodiments for delivery of electronic books using a cable  
11 system.

12          Figure 28 presents embodiments for delivery of electronic books using a wireless  
13 broadcast system.

14          Figure 29 presents embodiments for delivery of electronic books using a satellite  
15 broadcast system.

16          Figure 30 presents embodiments for delivery of electronic books using a wired  
17 data network.

18          Figure 31 presents embodiments for delivery of electronic books using the PSTN.

19          Figure 32 presents embodiments for delivery of electronic books using a wireless  
20 PCS network.

21          Figure 33 shows a storage device that stores a portable storage medium containing  
22 an electronic book.

23          Figure 34 is a block diagram of an alternate system for requesting and delivering  
24 electronic books.

## 25 Detailed Description Of Invention

26          Figure 1a shows an electronic book distribution system 100 that may be used for  
27 distributing an electronic book. A content provider 110 may publish hard copy versions  
28 of books or other printed media including newspapers, magazines, and product catalogs,

for example. The content provider 110 may convert printed materials to an electronic format and provide the electronic formatted materials to a distribution point, or center 120, over uplink path 115. The uplink path 115 may be a wired or a wireless path. The uplink path 115 may be a telecommunications network, for example. The uplink path 115 may be a satellite relay path or a wireless telephone path. The uplink path 115 may involve providing electronic books to the distribution center on a fixed media, such as a CD-ROM, for example.

In Figure 1a, the content provider 110 and the distribution center 120 are shown as separate components of the electronic book distribution system 100. However, the content provider 110 and the distribution center 120 may be co-located.

The distribution center 120 may convert printed matter into an electronic format. Alternately, the distribution center 120 may receive electronic files from an outside source, such as the content provider 110. The distribution center 120 may process and store electronic books.

The distribution center 120 distributes electronic books. The distribution may be, for example, over distribution path 125, distribution network 130, and distribution path 135 to an electronic book subsystem or terminal 140, which may include an electronic book viewer (not shown). The terminal may also be a television, a set top terminal, a personal computer, or similar device. An apparatus and method for distributing electronic books is disclosed in greater detail later. The distribution network 130 may be an electronic book store, an Internet web site, a wired or wireless telecommunications network, an intranet, a radio program delivery system, a television program delivery system, including cable television, satellite television broadcast, and over-the-air broadcast, for example. The electronic book distribution network 130 could include direct delivery through a mail delivery system of electronic books on a fixed media, such as a CD-ROM, for example.

Figure 1b shows components of an electronic book distribution system 170 using a television program delivery system to distribute electronic books.

1 In the embodiment shown in Figure 1b, the components of the electronic book  
2 selection and delivery system 170 are an encoder 174, a video distribution system 178,  
3 a connector 182, and a text selector 186. The encoder 174 places textual data on a video  
4 signal to form a composite video signal. Although the composite signal may contain only  
5 textual data, it usually carries both video and textual data. A variety of equipment and  
6 methods may be used to encode text data onto a video signal. The video distribution  
7 system 178 distributes the composite video signal from the single point of the encoder  
8 174 to multiple locations, which have connectors 182. The connector 182 receives the  
9 digital or analog video signal from the video distribution system 178 and separates, strips  
10 or extracts the text data from the composite video signal. If necessary, the extracted text  
11 data is converted into a digital bit stream. The text selector 186 works in connection with  
12 the connector 182 to select text.

13 Using the connector 182 and text selector 186 combination, various methods of  
14 selecting and retrieving desired text from a composite or video signal are possible. Text  
15 may be preselected, selected as received or selected after being received and stored. One  
16 method is for the connector 182 to strip or extract all the text from the video signal and  
17 have the text selector 186 screen all the text as received from the connector 182. The text  
18 selector 186 only stores text in long term or permanent memory if the text passes a  
19 screening process described below.

20 Figure 2 shows another embodiment of an electronic book selection and delivery  
21 system 200. The delivery system 200 includes: an operations center 250 including an  
22 uplink site 254, a video distribution system 208, an electronic book device, or home  
23 system 258 including a video connector 212, a library 262, a viewer 266, and a phone  
24 connector 270, telephone system 274, an Internet web site 279 and a billing and  
25 collection system 278. Also as shown in Figure 2, the home system 258 may include  
26 connections to a television 259 and a personal computer 261 may be used to display  
27 menu screens, electronic books, electronic files, or any other information associated with  
28 the electronic book delivery system 200. In addition, the television 259 and the personal



1 computer 261 may provide control functions that replicate and supplement those of the  
2 viewer 266.

3 The operations center 250 receives textual material from outside sources 282 such  
4 as publishers, newspapers, and on-line services. Alternately, the outside sources may  
5 maintain electronic books at the Internet web site 279. The outside sources 282 may  
6 convert textual and graphical material to digital format, or may contract with another  
7 vendor to provide this service. The operations center 250 may receive the textual and  
8 graphical material in various digital formats and may convert the textual material to a  
9 standard compressed format for storage. In so doing, the operations center 250 may  
10 create a pool of textual material that is available to be delivered to the home system 258.  
11 The textual material may be grouped by books or titles for easy access.

12 As used herein, "book" means textual or graphical information such as contained  
13 in any novels, encyclopedias, articles, magazines, newspapers, catalogues, periodicals,  
14 or manuals. The term "title" may represent the actual title assigned by an author to a  
15 book, or any other designation indicating a particular group, portion, or category of  
16 textual information. The title may refer to a series of related textual information, a  
17 grouping of textual information, or a portion of textual data. For example, "Latest  
18 Harlequin Romance", "Four Child Reading Books (Ages 10-12)," "Encyclopedia  
19 'BRITANNICA'™," "President's Speech," "Instruction Manual," "Schedule of 4th of  
20 July Events," "Pet Handbooks," "Roe v. Wade," and "The Joy of Cooking," are suitable  
21 titles. Also, the title may be a graphical symbol or icon. Thus, a picture of a wrench may  
22 be a title for a repair book, a picture of a computer a title for a computer book, a graphical  
23 symbol of a telephone a title for a telephone book, a drawing of a dagger a title for a  
24 mystery book, a picture of a bat and ball a title for a sports book, and a picture of  
25 tickertape a title for a business book.

26 The operations center 250 includes the uplink site 254 for placing the text onto  
27 a telecommunications signal and sending the telecommunications signal into a  
28 distribution system. The uplink site 254 would generally include an encoder 204 (not  
29 shown in Figure 2) to encode the text onto the telecommunications signal.

1 Many analog and digital video distribution systems may be used with the  
2 electronic book delivery system 200, such as cable television distribution systems,  
3 broadcast television distribution systems, video distributed over telephone systems, direct  
4 satellite broadcast distribution systems, and other wire and wireless video distribution  
5 systems. Nearly any distribution system which can deliver a telecommunications signal,  
6 including a video signal, will work with the electronic book delivery system 200. It is  
7 also possible to distribute the electronic book without using a telecommunications signal  
8 as described in the embodiments presented in Section VII below.

9 The home system 258 performs five functions: (1) connecting with a video  
10 distribution system; (2) selecting data; (3) storing data; (4) displaying data; and (5)  
11 handling transactions. An important optional function of the home system 258 is  
12 communicating using, in one embodiment, a telephone communication system 274. The  
13 home system 258 may be made up of four parts: a video connector 212 or similar type  
14 of connector for connecting with the distribution system 208, a library 262 for storing and  
15 processing, a viewer 266 for viewing menus and text and a telephone connector 270 for  
16 connecting with a telephone communications system 274. Additional embodiments are  
17 presented in Section VII that address alternative communication mechanisms.

18 The billing and collection system 278 may be co-located with the operations  
19 center 250 or located remote from the operations center 250. The billing and collection  
20 system 278 may be in communication with the home system 258 using telephone-type  
21 communication systems (for example 274). Any of a number of communication systems  
22 as presented in Section VII, such as a cellular system or the Internet, will operate with the  
23 billing and collection system 278. The billing and collection system 278 records the  
24 electronic books or portions of text that are selected or ordered by the subscriber. The  
25 collection system will charge a subscriber's credit account or bill the subscriber. In  
26 addition, the billing and collection system 278 may monitor that amount due to publishers  
27 or other outside sources 282 who have provided textual data or other services such as air  
28 time to enable the text delivery system 200 to operate.

1 Also shown in Figure 2 is an intranet 279'. The intranet 279' may be used as a  
2 part of a private distribution network for distributing and circulating electronic books.  
3 For example, a university library may use the intranet 279' to circulate electronic books  
4 to university students and professors.

5 Figure 3 is an expanded overview of a delivery plan 301 for the electronic book  
6 delivery system 200. It is a comprehensive delivery plan 301 to support various types of  
7 users and various billing systems. Figure 3 shows that publishers 282 may provide text  
8 transfer 302 to the operations center 250' and receive payments 306 from the billing and  
9 collection system 278'. A separate channel uplink site 254' is shown in this  
10 configuration receiving data 310 from the operations center 250'. The operations center  
11 250' has three separate sections (318, 322, 326) one for text receiving, formatting and re-  
12 entry 318, a second for security encoding 322 and a third section for catalog and  
13 messaging center functions 326.

14 The collection and billing system 278' shown has two sections (330, 334) one for  
15 transaction management, authorizations and publisher payments 330, and the other for  
16 customer service 334. The customer service section 334 provides for data entry and  
17 access to customer account information. Transaction accounting information 338 is  
18 supplied to credit card companies 342 by the transaction management section 330 of the  
19 billing and collection system 278'. The credit card companies 342 provide billing 346  
20 to customers either electronically or by mail.

21 Methods for communicating between the subscriber base 348 and the billing and  
22 collection system 278' include: by telephone switching 350 alone, cellular switching 354  
23 and telephone switching 350 combined, and by use of the cable system 358 and the  
24 telephone switching 350. The system shown supports both one-way 362 and two-way  
25 cable communication 366 with subscribers. Additional communication methods are  
26 presented in Section VII. Public libraries and schools 370 as well as bookstores 374 may  
27 use the delivery system 301.

28 Public libraries and schools 370 could have a modified system to allow the viewer  
29 to be checked-out or borrowed while bookstores 374 would rent or sell the viewer and

1 sell electronic book data. The bookstores 374 as well as the public libraries and schools  
2 370 may be serviced by cable 378. Optional direct broadcast systems (DBS) 382 can also  
3 be used with the system 200 as detailed in Section VII.

#### 4 I. The Operations Center

5 Figure 4 is a schematic of the operations center 250, which includes the uplink  
6 254. The operations center 250 may gather text or books by receiving, formatting,  
7 storing, and encoding. A data stream 302 containing text may be received at the  
8 operations center 250 by a data receiver 402. The data receiver 402 is under the control  
9 of a processor 404. After reception, the data stream is formatted using digital logic for  
10 formatting 406 which is also under the control of the processor 404. If any additional text  
11 is generated at the operations center 250 locally for insertion into the distributed signal,  
12 the text generation is handled through text generator hardware 410, which may include  
13 a data receiver and a keyboard (not shown). Following processing by the text generator  
14 410, the additional text can be added to the text received by the combining hardware 414  
15 that includes digital logic circuitry (not shown).

16 The processing at the operations center 250 is controlled by a processor 404,  
17 which uses an instruction memory 416. The processor 404 and instruction memory 416  
18 may be supplied by a personal computer or mini-computer, for example. To perform the  
19 catalog and messaging functions, the operations center 250 uses a catalog and message  
20 memory 420 and the text generator 410 if necessary.

21 The data stream of text, catalog and messages may be encoded by security module  
22 encoding 424 prior to being sent to the uplink module 254. Various encoding techniques  
23 may be used by the security encoding module 424 such as the commercial derivative of  
24 NSA's encryption algorithm (Data Encryption System (DES)) and General Instrument's  
25 DigiCipher II. Following encoding, the encoded text may be stored in text memory 428  
26 prior to being sent to the uplink 254. A first-in-first-out text memory arrangement may  
27 be used under the control of the processor 404. Various types of memory may be used  
28 for the text memory 428 including RAM. The operations center 250 may use file server  
29 technology for the text memory 428 to catalog and spool books for transmission as is

1 described below. The operations center 250 may also store the electronic book as  
2 compressed data files.

3 In an embodiment, to transmit textual data, the distribution system 208 (see  
4 Figure 2) may use high bandwidth transmission techniques such as those defined by the  
5 North American Broadcast Teletext Standard (NABTS) and the World System Teletext  
6 (WST) standard. Using the WST format (where each line of the Vertical Blanking  
7 Interval contains 266 data bits), a four hundred page book, for example, may be  
8 transmitted during regular television programming using four lines of the Vertical  
9 Blanking Interval at a rate of approximately one book every 1.6 minutes (63,840 bits per  
10 second). Alternatively, books may be transmitted over a dedicated channel, which  
11 interrupts programming so that 246 lines of video can be used to transmit approximately  
12 2,250 books every hour (3.9 Mbits per second). A teletext type format is the simplest but  
13 possibly the slowest text format to use with the electronic book delivery system 200. In  
14 either event, an encoder 204 may be used at an uplink site 254 to insert textual data into  
15 the analog video signal. In many other respects, the delivery of the textual information  
16 may be completed using an existing cable television plant and equipment. Alternative  
17 transmit formats and delivery systems are presented in Section VII.

18 Figure 5a is a flowchart of steps involved in processing text from the publisher  
19 or provider 282 that may occur at the operations center 250. As shown in block 500, the  
20 publisher 282 processes data files of text for books, compresses, encrypts and sends the  
21 data files to the operations center 250 or uplink 254. Text files for books may be sent one  
22 book at a time. As shown in block 504, the uplink 254 or operations center 250 receives  
23 and processes the data stream from the publisher 282. Generally, part of this processing  
24 includes encryption and error correction. Text files may be delivered for receipt by  
25 multiple home subsystems simultaneously, or to a specific individual home subsystem.

26 In Figure 5a, the electronic books are distributed to consumers using a video  
27 distribution system such as a cable television system. However, the electronic books may  
28 also be packaged as data packets and distributed over other telecommunications networks  
29 such as a digital wireless telephone network, for example.

1 In one embodiment, as shown in block 508, files are broken into smaller packets  
2 of information. Header information is added to the packets. The bit stream is converted  
3 from a serial digital bit stream to an analog bit stream that is compatible with an NTSC  
4 video signal. Block 512 shows the switching of analog data into the video lines of a  
5 video signal. The analog data may be placed either in the VBI or the active video lines.  
6 In some instances, unused portions of bandwidth (such as 5-40 MHZ, 70-75 MHZ, 100-  
7 109 MHZ or other guard bands) may be used instead of the video lines. Alternate  
8 transmission methods are presented in Section VII.

9 Figure 5b is an example of a hardware configuration to perform some of the  
10 functions for blocks 508 and 512. A video feed 516 is received and processed through  
11 a sync stripper 520. The stripped sync signal 532 is used by the digital logic control 524.  
12 The digital logic control 524 receives the sync signal 532 and a serial digital bit stream  
13 528 for processing. The digital logic control 524 passes the serial digital bit stream to the  
14 Digital to Analog converter 536 and outputs a control signal 540 for the video switch  
15 544. The video switch 544 integrates the video feed 516 and analog data stream 548 into  
16 a video feed with analog data signal inserted 552.

17 As an alternative to cable, broadcast or other television delivery methods, the  
18 public telephone system may be used to transmit books to the subscribers. An average  
19 book would take about 7 minutes to transmit over the public telephone system. Using the  
20 telephone system, it is not necessary to combine video and text into a composite signal.  
21 In most other respects, the operations center would remain similar whether text delivery  
22 was by telephone or cable. File server technology (such as that described in U.S. Patent  
23 No. 5,262,875, entitled AUDIO/VIDEO FILE SERVER INCLUDING DECOMPRESSION/  
24 PLAYBACK MEANS, issued to Mincer, et al., and, U.S. Patent No. 5,218,695, entitled FILE  
25 SERVER SYSTEM HAVING HIGH-SPEED WRITE EXECUTION, issued to Noveck, et al.,  
26 incorporated herein by reference) may be used at the operation center with a telephone  
27 system text delivery method.

28 As another alternative to cable, television, and telephone system delivery, the  
29 public telephone system may be used to provide access to the Internet, where the Internet

1 web site 279 may be accessed. Electronic books may be ordered, paid for, and delivered  
2 directly from the Internet web site 279 over the telephone system.

3 When a wireless telephone network is used to distribute electronic books, or  
4 otherwise communicate with the home system 258, the home system may receive data  
5 using any one or more standard protocols including time division multiple access  
6 (TDMA), code division multiple access (CDMA), Global Systems for Mobile  
7 Communications (GSM) and Advanced Mobile Telephone System (AMPS) protocols.

8 In any delivery system using the telephone system, individual subscribers may  
9 increase the electronic book deliver rate by incorporating high speed modems or other  
10 communications devices such as an Integrated Services Digital Network (ISDN)  
11 connector, or by use of an Asymmetric Digital Subscriber Line (ADSL). These  
12 alternative delivery methods are presented in Section VII.

## 13 II. The Home Subsystem

14 The hardware configuration for a four component home system 258 is shown in  
15 Figure 6a. Figure 6b shows a hardware configuration for a two component home  
16 subsystem. The home system 258 performs several functions, such as receiving data and  
17 video transmissions, stripping (or extracting) the data from the video signal, screening  
18 and storing the data, providing user friendly interface controls and software, displaying  
19 menus and text, processing transactions, initiating telephone calls and transmitting billing  
20 data. Various hardware configurations may be utilized to achieve the desired functions  
21 of the home system 258. For example, as shown in figure 6b, the home system 258 can  
22 be configured to utilize the reception and channel tuning capability of the current  
23 installed subscriber base of cable converter boxes and televisions 601 and networked  
24 computers. The home system 258 can also be designed as an advanced set top terminal  
25 converter box with menu generation capability, electronic memory and a telephone  
26 modem as described in section V below. Alternatively, the home system 258 can be  
27 configured to support alternate delivery and ordering methods as described in Section  
28 VII.

1           The electronic components, which make up the home system 258 can be arranged  
2 in a variety of ways. In the four unit subsystem of figure 6a the viewer 266 and library  
3 262 are wired together while the remaining components communicate through RF  
4 transceivers 604. In a simple version of the home system 258 there are only two units,  
5 a library 262 and a viewer 266. Figure 6b shows a two unit home system 258 with certain  
6 optional features.

7           The viewer 266 is generally equipped with a high resolution viewing area 602,  
8 digital logic (including a key 605, security 606, and a microprocessor 621), video  
9 graphics control and memory 607, power supply circuitry 602 (not shown), an optional  
10 battery 603 and an optional RF transceiver 604. In a two unit arrangement, the library  
11 262 contains the connector function to the electronic book distribution system 208,  
12 connector function to a public telephone communications system, and memory 600  
13 (which may be removable and portable 600'). More specifically, the library 262 would  
14 include data stripping functions 617, digital logic 609, memory storage 600, power  
15 circuitry 610, optional connections 611 (including cellular or PCN 611'), optional battery  
16 (not shown), optional tuner module 613 and an optional RF transceiver 604. The  
17 connector 212 and the public telephone system connection 270, as well as the removable  
18 portable memory unit 600 of the library 262 may be broken out into separate components.  
19 (Figure 6b shows a removable portable hard disk memory 600' with removable cartridges  
20 614.) Finally, the home system 258 may include an attached keyboard 267 or a wireless  
21 keyboard 268. Both the attached keyboard 267 and the wireless keyboard 268 may be  
22 used to communicate with the viewer 266 (not shown) or the library unit 262. The  
23 wireless keyboard 268 may communicate using radio frequency (RF) signaling, for  
24 example.

25           In an alternate arrangement, all functions of the home system 258 may be  
26 incorporated into a single unit. The functions of the library 262, for example, may be  
27 carried out by a card or chipset in the viewer 266. All the communications devices  
28 needed to couple the home system 258 to various telecommunications networks may also  
29 be incorporated into the viewer. All interfaces between the home system 258 and the



1 subscriber may be included with the viewer 266. In this embodiment, the viewer 266  
2 may include a communication device for receiving inputs from a separate keyboard. The  
3 viewer 266 may also include a built-in video camera 608" that may be used to transmit  
4 images of the subscriber. Using the transceiver 608, the camera 608" and the  
5 speaker/microphone 608', the subscriber may use the viewer 266 for video conferencing,  
6 for example.

7 Therefore, the home system 258 may have as many as five separate components,  
8 which communicate with each other. The two, three, four or five separate components  
9 which make up the home subsystem can communicate with each other in a variety of  
10 ways, including hardwired connection 615, RF transceiver 604 and other wireless  
11 methods.

12 RF communications may be used in the home, allowing separate components to  
13 be located throughout the home without restriction. The data communicated between the  
14 units may be secure data. In addition, the library 262 may provide power to the viewer  
15 266 through the hard wire communication link 615.

16 To receive and strip data from a video signal at the consumer's home, a device  
17 such as a cable interface device or cable connector 212 is used. The cable connector  
18 device includes a tuner 613, while the cable interface device makes use of existing tuning  
19 equipment in the home. In either configuration, data is stripped from the video signal  
20 and stored at the subscribers location in the library 262. The phone connector 270,  
21 optional connector 611, and modular connector 701 initiate communications and transmit  
22 ordering and billing information to the operations center 250 or billing and collection  
23 system 278. A digital connector 619 is provided to communicate digital information with  
24 the set top 601. The library 262 is the intelligent component of the home subsystem,  
25 incorporating the hardware and software necessary to store the text data, generate menus  
26 and effect the purchase transactions. In addition to an RF transceiver 604, the home  
27 library 262 also includes the necessary jacks and connections to allow the system to be  
28 connected to the viewer 266. As shown in Figure 6b, the library 262 communicates the

1 text data to the viewer 266 in a secure format, which requires a key 605 for decryption.  
2 The text may be decrypted page by page just before viewing.

3 a. The Video Connector

4 Figure 7 shows the flow of the processes performed by the video connector 212.  
5 The video connector 212 receives the video signal 608, tunes to the channel containing  
6 the text data 612, strips the text data from the video signal 616, and communicates the  
7 text data stream to logic components in the library 620.

8 The connection to the video distribution system may be a cable connector to a  
9 cable television delivery system, as shown in Figure 6b. The cable connector includes  
10 a data stripper circuit 617, which accepts video input from either a set top converter, TV  
11 or VCR 601, or an optional tuner block 613 that receives the CATV signal through the  
12 cable connector 212'. The data stripper circuit 617 strips data out of the video, and  
13 outputs a digital bit stream to the digital logic portion 609 of the library unit 262. The  
14 data is embedded in the video signal either in the vertical blanking interval or the active  
15 video portion in an encrypted and compressed format. The data stripper circuit 617 can  
16 be placed inside the set top converter box 601, TV, or in the library unit. The data  
17 stripper circuit 617 outputs the digital bit stream to be used by the library digital logic  
18 609.

19 The video connector 212 may also contain a channel tuner module 613 that can  
20 tune to the video channel and provide access to the video that contains the data to be  
21 stripped. Using the optional tuner module 613, a set top converter, VCR, or TV tuner is  
22 not needed in the home subsystem. The optional tuner module 613 would instead receive  
23 the CATV signal directly through the cable connector 212. Additional connector options,  
24 which allow for the receipt of text files using alternative delivery methods, are presented  
25 in Section VII. This ubiquitous access is provided using the modular connector 700 as  
26 depicted in Figure 6b.

27 b. Library

28 An embodiment of the library 262 for a two unit home subsystem is shown in  
29 both Figure 6b and Figure 8. The embodiment shown includes the following optional

1 parts: the video connector 212, phone connector 270, RF transceiver 604, and battery  
2 pack 624 in addition to a removal portable memory 600', microprocessor 628, instruction  
3 memory unit 632, digital logic 636, and power unit 640.

4 The library 262 contains a digital logic section 609 (not shown in Figure 8) which  
5 includes the microprocessor 628, the digital logic 636 and the instruction memory unit  
6 632. The microprocessor 628 may be a secure microprocessor such as the Mot SC21  
7 device sold by Motorola. The digital logic section 609 will receive the serial digital bit  
8 stream from the data stripper circuit 617 and process the data. Error correction will also  
9 be performed by the digital logic section 609 and the data will be checked for proper  
10 address. If the address of the data is correct and the library 262 is authorized to receive  
11 the data, the data will be transferred to the memory storage unit 600, 600'. Authorization  
12 to receive the data is provided by the cable headend or another distribution point. An  
13 authorization code may be sent in the serial digital bit stream. The digital logic section  
14 609 will send appropriate text and graphical data to the memory storage unit 600, 600'.  
15 It transfers this data in a compressed and encrypted format and the data remains stored  
16 in a compressed and encrypted format.

17 i. Memory Storage Unit

18 The memory storage unit of the library may be a removable portable memory unit  
19 600' (as shown in Figures 6a, 6b and 8). A variety of options are available for memory  
20 storage: a hard disk drive, such as an 80 megabyte, a 200 megabyte, a hard disk with  
21 removable platters, and CD ROM. Referring to Figure 6b, a hard disk drive unit 600',  
22 which contains removable platters, may also be used. This would provide virtually  
23 unlimited library storage capacity. Data will be stored in the memory storage unit in a  
24 compressed and encrypted format. As is also shown in Figure 6b, the data may also  
25 contain a key or unique ID number that matches the ID or key of the viewer 266. This  
26 matching of a unique key or ID number prevents unauthorized transfer of text data from  
27 the memory storage unit to an unauthorized viewer. Small memory devices such as smart  
28 cards, electronic memory cards or PCM CIA cards (personal computer memory card  
29 industry association) may also be used to store the data.

ii. Power Circuitry

As shown in figures 6b and 8, the library 262 will accept power from AC wall power 610, DC power 640, or optional battery power 624. The power circuitry 610, 640 may provide all the voltage necessary from either the battery 624 or AC unit for the various circuitry in the library. The power circuitry 610, 640 may also provide power to the viewer through a single data cable when connected to the viewer. The power circuitry 610, 640 will recharge the battery using AC power when in operation. With the optional battery unit 624 installed, the library 262 becomes a portable unit and can still provide power to the viewer 266. In order to extend battery life, power conservation measures may be utilized, such as shutting down the memory system when not in use. When the viewer unit 266 is being utilized and the library circuitry is not being utilized, virtually all power may be shut down to the library 262.

iii. Connection to the Public Telephone System

In an embodiment, the connection to the telephone system may be provided by a connector device 611, which consists of a modem. Various available modems may be used to perform this function. As shown in Figure 6b, cellular phone or PCN phone connections 611' may also be provided. When the home system 258 is first initialized, the modem may be used to transfer the name and credit card information of the consumer to the billing and collection system 278. The telephone connection 270 may be utilized each time an electronic book is purchased by a consumer to complete and record the transaction. The telephone connection 270 may also be used to receive the text data from the operations center 250, by-passing the video distribution system 208. The phone connection 270 may be a separate unit as shown in Figure 6b. However, alternate means exist to connect the home system 258 to the billing and collection system 278 or the operation center 250. The modular connector 701 (shown in Figures 6b and 8) provides access to each communication network to provide a path from the home system 258 to the billing and collection system 278 or the operations center 250. These alternatives are presented in detail in Section VII.

iv. Library Processing

Figure 9 shows for one embodiment, an example of processing performed by the digital logic section 609 of the library 262 on the data stream 651 received from the video connector 212 or stripper circuit 617. In step S650, digital logic section 609 checks the data stream 651 for error correction. If an error is detected, in step S654 digital logic section 609 de-interleaves the data and in step S658 runs a FEC (Forward Error Correcting) algorithm. In steps S650, S654 and S658, the digital logic section 609 performs the error correction needed on the data stream. If no error correction is necessary the digital logic section 609 proceeds to step S662 and checks data packets individually for packet address.

If the address is a unique address, the process moves to step S666 and the digital logic section 609 checks whether the address of the packet matches the library box ID number. The library box ID number is a unique number associated with the library 262. The library box ID is used to ensure security of the data. The process then moves to step S670 and the digital logic section 609 determines whether an electronic file has already been opened into which the data packet can be saved. If no data file has been opened, the digital logic section 609 opens a new data file for that packet. If an electronic file has been opened, the process moves to step S678 and the digital logic section 609 saves the packet in the electronic file on disk. The process moves to step 682 and the digital logic section 609 checks to see if this is the last packet for a particular book for a particular textual data block being received. If it is the last packet of information, the process moves to step 686 and the digital logic section 609 closes the electronic file and updates the directory of available electronic files. Following either step S682 or S686, the process returns to receive another data packet from the data stream received from the data stripper block.

If the packet address is checked and the address is determined to be a broadcast address, the process moves to step S690 and the digital logic section 609 determines the type of message that is being sent. The message may be an index of book titles, menu (and menu graphics) information, announcements, special offerings, discounts,

1 promotions, and previews, for example. The process then moves to step S694 and the  
2 digital logic section 609 stores the message in an appropriate electronic message file.  
3 The process then returns to step S650 to receive another data packet and perform another  
4 error check.

5 Using the process of Figure 9, the library 262 is able to receive, store and update  
6 directories related to the textual data and graphical data (that can be used to depict  
7 pictures in a given book or to generate menus). Variations of the processes are possible  
8 depending on the format of the data and operating system of the library 262.

9 Figure 10 shows an example of the processing of information requests from the  
10 viewer 266 at the library 262. Information requests from the viewer 266 are received  
11 either through the cable connecting the viewer 266 to the library 262 or through wireless  
12 transmissions such as RF. It is possible in some embodiments for subscribers' requests  
13 to come from a set top converter box 602 (see Section V).

14 Information requests received from the viewer 266 generally fall into three  
15 categories: (1) directory data of books stored in the library 262, (2) index of all available  
16 books on the system, and (3) requests for a specific book (step S700). In step S704, the  
17 digital logic section 609 answers a request from the viewer 266 for a directory of data  
18 showing the books stored at the viewer 266. The directory of data is sent to the viewer  
19 266 so that it may be displayed to the subscriber. In step S708, the digital logic section  
20 609 handles requests from the viewer 266 for an index of all available books on the  
21 system. The library 262 will obtain an index of all the available books on the system and  
22 transmit that index, in step S712, with menu information to the viewer 266. In step S716,  
23 the digital logic section 609 replies to a request from the viewer 266 for a specific book.  
24 In step S720, the digital logic section 609 opens an electronic file for the specific book  
25 requested by the viewer 266 and transmits the record or transmits the information on a  
26 packet-by-packet basis to the viewer 266. This process of transmitting the specific book,  
27 record, or packets to the viewer 266 continues until the last record or packet has been sent  
28 in step S724.

1 In addition to the processes shown on Figure 10 in handling a request for a  
2 specific book, the library 262 also orders and receives specific books from the operations  
3 center 250 using the process as described in step S716. Following a request for a specific  
4 book which is not stored at the library 262, the library 262 will proceed to determine the  
5 next available time the book will be on the video distribution system 208 or an alternative  
6 delivery system and ensure reception and storage of that book (process not shown). In  
7 performing this process the library 262 will transmit to the viewer information on when  
8 it will obtain the text data for the book so that the subscriber may view the book. In  
9 addition to timing information, price and other ordering information may also be passed  
10 by the library 262 to the subscriber.

11 c. The Viewer

12 Figure 11 is a block diagram of a viewer 266 showing its internal components.  
13 The viewer 266 of Figure 11 is similar to the viewer 266 depicted in Figure 6b. The  
14 viewer 266 is designed to physically resemble a bound book. The viewer 266 is made  
15 up of five primary components and seven optional components: (1) LCD display 602,  
16 (2) digital circuitry (not shown), (3) video graphics controller 607', (4) controls 740, (5)  
17 book memory 728, (6) optional power supply circuitry 736, (7) optional battery 603', (8)  
18 optional RF transceiver 604, and (9) optional cellular or mobile connector (such as 611')  
19 (10) optional keyboards 267 and 268, and (11) an optional speaker/microphone 608',  
20 (12) optional alternative communication interface devices.

21 (1) A high resolution LCD screen 602, of VGA quality, may be used by the  
22 viewer 266 to display text and graphic images. The screen may be the size of one page  
23 of an electronic book. A two page screen or two screens may also be used with the  
24 viewer 266.

25 (2) Digital circuitry that includes a secure microprocessor 621, instruction  
26 memory 732, and digital logic. Data is transferred to the viewer 266 in compressed and  
27 encrypted format. The secure microprocessor 621 compares the ID number of the viewer  
28 266 with the incoming data stream and only stores the text data if the ID number of the  
29 viewer 266 matches that within the incoming data stream. The viewer 266 may be

1 configured to not output text data or other data and that the data is decompressed and  
2 decrypted only at the moment of viewing and only for the current page being viewed.  
3 These measures provide additional security against unauthorized access to data.

4 (3) A video graphics controller 607' that is capable of assisting and displaying  
5 VGA quality text and graphic images is included in the viewer 266. The graphics  
6 controller 607' is controlled by the digital circuitry described above. Text may be  
7 displayed in multiple font sizes.

8 (4) The viewer 266 of Figure 11 has touch panel controls 740. These unique  
9 and novel controls 740 allow the consumer to select stored electronic books and  
10 electronic books from catalogues, move a cursor, and turn pages in an electronic book.  
11 Typically, the controls 740 include forward and reverse page buttons 742, 741, a ball 743  
12 for cursor movement, one or more selection buttons 745, a current book button 747 and  
13 a bookmark button 749 (see Figure 14a).

14 The controls 740 should be easy to use and conveniently located. Referring to  
15 Figure 14a, the controls for the viewer 266 may be located below the screen 602 at the  
16 bottom portion of the viewer 266. The next page turn button 742 is the most used button  
17 740 and is located towards the right edge of the page. The subscriber is likely to use right  
18 hand thumb movements to work the controls particularly the page turn buttons 741, 742.  
19 Therefore, the buttons may be arranged in such a manner that the buttons are easily  
20 controlled by a subscriber's right thumb. Generally, this can be accommodated either on  
21 the lower portion of the viewer 266 (as shown) or along the right hand margin of the  
22 viewer 266 (not shown). The current book button 747 and bookmark button 749 are  
23 usually the least used of the controls 740. Therefore, in the example shown, those  
24 buttons 747, 749 are located on the inside portion towards the binder of the viewer 266.

25 Locating the ball 743 or other cursor movement device (such as four pointer  
26 arrows not shown) in the bottom center of the viewer 266 is both easier for the subscriber  
27 to use and easier in manufacturing the viewer 266. The selection buttons for the cursor  
28 745 may be located below the middle diameter of the cursor ball 743 on the right and left  
29 sides of the ball as shown. If pointer arrows are used for cursor movement, a selection



1 button 745 may be located in the center of the four arrow buttons (not shown). Again,  
2 the most used controls 740 should be located where a subscriber's right hand thumb  
3 would normally rest.

4 (5) Book memory 728 for at least one electronic book or more of text is included  
5 in the viewer 266. The memory 728 stores text and any graphics, which represent  
6 pictures in a book. The memory 728 can also store menu graphics data. Two different  
7 memory 728 devices may be used in the viewer 266, one for the instructions for the  
8 microprocessor 621 in the digital circuitry and a second type of memory may be used for  
9 the book memory 728 (and graphics). Various memory devices available on the market  
10 may be used such as, ROM, RAM or a small hard disk. Since an electronic book requires  
11 approximately 0.6 megabytes of storage, a small hard disk providing approximately 60  
12 MBytes of storage provides memory to store approximately 100 electronic books.

13 Text for electronic books may be displayed in various font sizes. To  
14 accommodate various fonts for display, a variety of fonts are stored in instruction 732 or  
15 book memory 728. Thus larger or smaller fonts may be recalled from memory 621, 728  
16 to create displays desired by the subscriber.

17 (6) Power supply circuitry 736 in the viewer 266 will accept power from  
18 either an AC power source or from an optional battery 603', or the library 262. The  
19 power supply circuitry 736 provides the necessary voltages to accommodate the various  
20 systems within the viewer 266.

21 (7) An optional battery 603' is provided in one embodiment. The battery 603'  
22 is automatically recharged when AC power is available.

23 (8) An optional RF transceiver 604 which provided two-way data link  
24 between the viewer 266 and other components of the home subsystem can also be  
25 included in the viewer 266.

26 (9) Also, the viewer 266 may include a cellular transceiver (not shown) for  
27 mobile communications.

(10) The optional wired (attached) keyboard 267 and wireless (e.g., RF) keyboard 268 (see Figure 6a) may be used with the viewer 266 to provide communications between the subscriber and the viewer 266.

(11) The optional speaker and microphone 608' allow the viewer 266 to provide audio signals to the subscriber, and allow the subscriber to provide an audio input. The speaker and microphone 608' may be used in conjunction with the cellular transceiver 608 or other telecommunications equipment to provide for reception and transmission of telephony and data.

(12) The optional alternative communication interface devices allow the viewer 266 to make use of a variety of communication paths.

The viewer 266 of Figure 11 has parts available for providing connections to: a library 744, electronic card memory 748, CD ROM units 752, and a portable memory unit 756 (such as that shown in Figure 6b as 600'). Various electronic memory cards such as PCMCIA can be used with the viewer 266 to supply and store electronic books.

Security, low power consumption and excellent display technology are desired features of the viewer 266 design. The viewer 266 should be lightweight and portable. The viewer 266 contains a software operating system that allows electronic books to be stored, read and erased and includes the capability to order electronic books and retain them in memory 728 for a predefined period of time determined by the system operator. The software can be configured to allow the electronic book to be read during a period of time (i.e., two weeks) and then automatically erased, read once and erased, or held in memory permanently. Each viewer 266 may have a unique key 605. All of the data storage may be encrypted with the key 605 for an individual viewer 266 to prevent more than one viewer 266 accessing the text file or electronic book file.

Figure 12 is a flow diagram of some of the processes executed by the microprocessor 621 in the viewer 266. The viewer 266 may receive inputs from the subscriber through touch panel controls 740. In step S800, the subscriber's information requests are then processed by the microprocessor 621.

1 In step S804, if the subscriber requests a menu of available electronic books, the  
2 microprocessor 621 will select an electronic book menu. In step S808, the  
3 microprocessor 621 will open the electronic files that list the electronic books which are  
4 available (related to the category of topic of the menu) and display the menu with the  
5 names of the available electronic books.

6 If the subscriber selects a particular book to read, then in step S812, the  
7 microprocessor 621 will process the selection and determine the electronic file that  
8 contains the specific electronic book. In step S816, the microprocessor 621 will open the  
9 file for that specific electronic book and normally access the first page. (If a pointer has  
10 already been set in that books electronic file, the process may default to that page.) In  
11 step S820, the microprocessor 621 will then determine which page needs to be displayed.  
12 That is, the microprocessor 621 will determine whether a next page, previous page or a  
13 bookmarked page needs to be displayed. If the pointer for the electronic file is not in the  
14 correct location then in step S828, the microprocessor 621 will move the pointer and  
15 obtain the previous page of data from the stored file. Otherwise, in step S824, the  
16 microprocessor 621 will normally obtain the next page of text from the stored electronic  
17 file. In step S832, the microprocessor 621 will decrypt and decompress the text data and  
18 send the data to the video display. The video display will generally have a video display  
19 memory associated with it. In step S832, the microprocessor 621 will send the data  
20 directly to that video display memory. The circuitry for the display then completes the  
21 process of displaying the page of text.

22 If the subscriber, through the controls 740, requests (from step S800) that the  
23 power be turned off, then in step S836, the microprocessor 621 initiates power off. In  
24 step S840, the microprocessor 621 saves the pointer in memory to the page number in the  
25 book that the viewer 266 is currently reading. In step S844, the microprocessor 621  
26 closes all the electronic files and signals the power circuitry to shut down the power to  
27 the various circuits in the viewer 266. With these examples of basic processes the viewer  
28 266 is able to display book selections and display text from those electronic books.

d. Menu System

Referring generally to Figure 13, the electronic book system 200 may have a menu system 851 for selecting features and books from the electronic book system 200. The operating software and memory required for the menu system 851 may be located at the viewer 266 (e.g., the instruction memory 732 and/or book memory 728). However, it can also be located at the library 262 (e.g., the instruction memory 632) or the library 262 and the viewer 266 can share the software and memory needed to operate the menu system 851. Since the menus are usually displayed on the viewer, and since the viewer 266 may be capable of operating in the absence of the library 262, the basic software and memory to create the menus is more conveniently located at the viewer 266.

The menu system 851 allows sequencing between menus and provides menu graphics for graphical displays such as on the LCD display 602 of the viewer 266. In an electronic book system that uses a set top converter these menus may also be displayed on a television screen. In an electronic book system that uses a computer, these menus may also be displayed on the computer monitor. In an embodiment, the menus provide just basic text information from which the subscriber makes choices. In other embodiments, the menus provide visual displays with graphics and icons to assist the subscriber and allow for subscriber interaction and real-time ordering of electronic books or other content available to the subscriber.

Figure 13 depicts the menu system 851 with sequencing. The primary menus in the menu system 851 are an introductory menu 850, a main menu 854 and various submenus 858. In the embodiment shown, there are three levels of submenus 858. In certain instances one or two submenus 858 is sufficient to easily direct the subscriber to the selection or information requested. However, there are features in which three or more submenus 858 make the user interface more friendly for the subscriber. Each level of submenus 858 may consist of multiple possible menus for display. The particular menu displayed depends on the selection by the subscriber on the previous shown menu. An example of this tree sequence of one to many menus are the help submenus 887, 888.

1 Depending upon the specific help requested, a different level two help menu is displayed  
2 to the subscriber.

3 An example of an introductory menu 850 is shown on Figure 14a. Generally the  
4 introductory menu 850 introduces the viewer 266 to the system and provides initial  
5 guidance, announcements and instruction. The introductory menu 850 is followed by a  
6 main menu 854, an example of which is shown in Figure 14b. The main menu provides  
7 the viewer 266 with the basic selection or features available in the system. Figure 14b  
8 is an example of a main menu 854 offering many additional features and submenus 858  
9 to the subscriber. For example, Figure 14b shows that the viewer 266 is able to choose  
10 by a point and click method, many options including: (1) free previews, (2) books you  
11 can order, (3) books in your library, (4) your current book, (5) help, (6) on-line services  
12 and (6) other system features. Following a selection on the main menu 854, a  
13 corresponding submenu 858 is shown.

14 Figure 13 shows fourteen available primary or first level submenus. They are (1)  
15 account set up 862, (2) free previews 866, (3) book suggestion entries 855, (4) books in  
16 your library 872, (5) books you can order 878, (6) your current book 884, (7) help 887,  
17 (8) available features 890, (9) messages 893, (10) account information 896, (11) outgoing  
18 message submenu 898, (12) show links submenu 970, (13) create links submenu 980, and  
19 (14) show interactive files submenu 990. Figure 14c is an example of a first level  
20 submenu for books in your library 872. This "Book In Your Library" example submenu  
21 872 shows six available books by title and author and provides the subscriber with the  
22 ability to check a different shelf of books 874 or return to the main menu 854. Figures  
23 14d and 14e show example submenus 858 for books that may be ordered using the  
24 "Books You Can Order" submenu 878.

25 Figure 14f is an example of a confirmation menu which confirms a subscribers  
26 order. In this particular example, the subscriber is required to enter a PIN number to  
27 complete the subscriber's order. Any alpha-numeric or similar password may be used to  
28 ensure the subscriber is an authorized subscriber. In one embodiment, the subscriber

confirms an order with a PIN or password and then receives a final confirmation screen.

The final confirmation screen is primarily text and may state:

**Your book order is now being processed using CABLE.**

**Your book will be delivered overnight and your VISA account will be charged \$2.95.**

**Your book will be available for reading at 6:00AM EST tomorrow. Make sure that:**

**1. your Library Unit and Cable Connection Unit are plugged in with aerials up tonight; and**

**2. you tune your cable converter to THE BOOK Channel. The TV set does not have to remain on.**

or similar language.

Examples of the "Account Set Up Menu" 862 and further submenus 858 related to account set up (which provide instructions and account input 864) are shown in Figures 14g and Figure 14h. These submenus 858 allow initialization of an account at the operations center 250 and orders to be charged to credit cards. The submenus 858 include the ability to enter data related to your desired PIN number or password, credit cards, phone numbers, etc. In one embodiment, the account set up be performed using the telephone system. A confirmation menu verifies that the account has been properly set up with the desired PIN or password and credit card. However, additional set-up methods are presented in Section VII.

Free previews for books 866 are also provided by submenus (868, 870). Examples of the free preview menus are shown in Figure 14i and Figure 14j. Figure 14i shows a menu depicting various books for which previews are available for viewing. Following a book selection, a screen submenu showing an excerpt of the selected book cover's description is provided along with an excerpt from a critic's review of the selected book. In one embodiment, this preview screen for a particular book also allows the subscriber to select a submenu which provides information about the author. The book preview submenu may also include a still video picture or graphics portraying a book

1 cover or a scene from the book. An example of such a still video picture or graphics is  
2 shown in figure 14j which depicts a preview screen 870 about the author. The author's  
3 preview screen 870 shows a picture of the author, provides a short biography, and may  
4 allow the subscriber to order the author's books. The price for ordering the authors  
5 various books may also be shown on the menu.

6 In addition to free previews, in other embodiments, the electronic book system  
7 200 provides the subscriber with a book suggestion feature (see 855). This is  
8 accomplished using the menu system 851 and the processor with associated memory  
9 located at the viewer 266, library 262 or at the distribution point (1020 or 250). When  
10 necessary, information for the book suggestion feature is sent in the text data of the signal  
11 to the home system 258. With this feature, books or authors are suggested to a subscriber  
12 based upon historical data of the subscriber's previous orders, demographics or mood of  
13 the subscriber, other indicators, and/or by text word searches.

14 In one book suggestion embodiment, text word searches of preview information  
15 (such as book cover descriptions, critics reviews and biographies about the author) and/or  
16 text of books or other titles are performed by the library 262 using databases stored in the  
17 library memory 600. Personalized book or author suggestions are made to the subscriber  
18 by obtaining information from the subscriber indicative of general subscriber interests.  
19 Subscriber entries may be solicited from the subscriber using the book suggestion entry  
20 submenu 855. The system uses these subscriber entries either directly or indirectly to  
21 search for books or authors to suggest to the subscriber.

22 Generally, the electronic book suggestion methods may be categorized into two  
23 categories, either responsive methods (which respond to a series of subscriber menu  
24 entries), or intelligent methods (which analyze data to suggest a book). Using a  
25 responsive or intelligent method, the system 200 determines a list of suggested titles or  
26 authors and creates a second or third level submenu 856, 857 to suggest the titles for  
27 subscriber selection.

28 Responsive methods of suggesting titles include, for example, the use of mood  
29 questions, searching for authors, and keyword searching. Using the instruction memory

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1 732 and menu generation hardware (e.g., 607) of the viewer 266, a series of mood  
2 questions can be presented on menus to determine a subscribers interest at a particular  
3 time. For this methodology, the operations center's 250 processor 404 and instruction  
4 memory 416 assign each title mood indicators (and sub-indicators) from a group such as  
5 light, serious, violent, short, long, dull, exciting, complex, easy-read, young theme, old  
6 theme, adventure, romance, drama, fiction, science-fiction, etc. These indicators are sent  
7 to the home system 258 with the text data and are stored in library memory 600. Based  
8 upon the subscriber entries, the processor associates a set of indicators with the  
9 subscriber's request and a set of books with matching indicators are located for  
10 suggesting to the subscriber.

11 Responsive searches for authors or keywords (a search word provided by the  
12 subscriber) are generally performed by the library processor 628 and instruction memory  
13 632 on data stored in the library memory 600. For example, a keyword given by the  
14 subscriber may be searched for a match in library memory 600 storing the book reviews,  
15 critics and previews databases. Thus, if a subscriber provided an entry of the word  
16 "submarine" on an appropriate submenu, the title "Hunt For Red October" may be  
17 located by the microprocessor 628 using instruction from a routine in instruction memory  
18 632.

19 Intelligent methods of suggesting programs include analyzing personal profile  
20 data on the subscriber and/or historical data about the subscriber such as past books  
21 ordered by the subscriber (or buy data). This method may be performed at the  
22 distribution point or operations center 250 by the on-site processor 404 using subscriber  
23 databases stored in memory 428. The home system 258 receives the text data including  
24 program suggestion information from the distribution point or operations center 250 and  
25 generates the program suggestion submenus 855, 856, 857 using the same text data  
26 receiving 212 and viewer menu generation hardware (e.g., 607, 621) described above.  
27 Software routines and algorithms stored in instruction memories (e.g. 632, 732) are used  
28 to analyze historical data and book ordered data to determine a line of books to suggest  
29 to the subscriber.



1 The algorithms for this powerful feature of suggesting books or authors to  
2 subscribers is disclosed in great detail in U.S. Patent Number 5,798,785, entitled  
3 TERMINAL FOR SUGGESTING PROGRAMS OFFERED ON A TELEVISION PROGRAM DELIVERY  
4 SYSTEM, filed December 2, 1993, which is incorporated herein by reference.

5 Referring to Figure 13, submenus 858 are shown on the "Books In Your Library"  
6 submenu 872 and may be broken into shelf numbers with submenus for each shelf 874,  
7 876. The submenus 858 for the "Books You Can Order" submenu 878 is similarly  
8 broken out into submenus by shelves 880, 882. These shelves may each be a category or  
9 genre of books. Books may be grouped into categories such as best sellers, novels,  
10 fiction, romance, etc. See Figure 14d.

11 Referring to Figure 13, the submenu 858 for "Your Current Book" 884 allows a  
12 subscriber to select a current book 884 and then determine what page to view. This  
13 selection is confirmed with a level two submenu 885. The help submenu 887 provides  
14 the subscriber with additional help screens 888. The submenus 858 for available features  
15 890 may be broken out into a sequence of separate submenus for each feature 891, 892.

16 Referring to Figure 13, messages can also be sent with the electronic book  
17 selection and delivery system 200. A level one message screen provides the subscriber  
18 with the ability to select from various messages the subscriber has pending 893. Each  
19 message is then shown on a separate submenu screen 894, 895. The message may  
20 contain text and graphics.

21 Referring to Figure 13, account information is shown on a level one submenu 896  
22 and then follow-on submenus 858 show the recent orders and your account balance 897.  
23 There is also a level one submenu for outgoing messages 898 which has a follow-on  
24 submenu used as an input screen 899.

25 In addition to the specific features and submenus described in Figure 13 and  
26 Figure 14a through Figure 14j, many other variations and features are possible. When  
27 a book is finally selected for viewing the title page 886 will appear on the screen followed  
28 by a page of text.

### III. The Billing And Collection System

In one embodiment, the billing and collection system 278 (shown in Figures 2 and 3) utilizes the latest technology in electronic transaction and telephone switching to track orders, authorize deliveries, bill consumers, and credit publishers automatically. The telephone calls initiated by the phone connector 270 are received by the billing and collection system 278 which responds immediately without human intervention by placing the order and charging the consumers credit card account. Data is compiled periodically and publishers 282 are credited for sales of their books or other text. The billing and collection system 278 may also connect with subscribers through two-way cable connections, cellular, or other communication means. These additional methods are detailed in Section VII.

The billing and collection system 278 communicates with the operations center to track changes in available books and to provide statistical data to the operations center 250.

### IV. Public Library, School, and Bookstore System

The electronic book system can be modified to be used at public libraries, schools, bookstores, newsstands, or stand-alone kiosks. Figure 15 shows one possible arrangement of components for the distribution location. The main unit is the file server 900. The file server 900 is a large electronic memory unit that can store thousands of books, newspapers, or periodicals. Various electronic storage means may be used in the file servers, such as hard disks, read-write CD ROMs and read-only CD ROMs.

The system comprises five components; the file server 900, a converter or video connector 904 or connector capable of interfacing to one of the alternative delivery systems presented in Section VII, a controller 908, a viewer 912, and a catalog printer 916. The software for controlling the system is primarily located in the controller 908. The converter or video connector 904 is similar to those described above. In this configuration the controller unit 908 monitors the data being transferred to the file server 900 by the converter 904. The controller 908 may be provided with a viewing screen and several control buttons. When it is necessary to have a larger screen to perform more

1 sophisticated controlling of the system a viewer 266 may be connected to the controller  
2 908 and the viewer screen and controls 740 may be used.

3 For security reasons, the controller 908 is only able to download books to public  
4 viewers 912 which are authorized to receive books from the particular file server 900.  
5 Also for security reasons it is not desirable that the public viewer 912 have access to more  
6 than one file server 900. In this way, security can be maintained over the text data for  
7 books. The public viewer 912 may be limited to receiving one or two books at a time  
8 from the controller 908. When the user of the public viewer 912 needs a new or  
9 additional book, the user returns the viewer 912 to the school or public library where the  
10 user receives a new book from the controller 908.

11 In order to track the books that are available on the file server 900, the titles of the  
12 available books may be printed on a catalog printer 916. The catalog printer 916 is  
13 connected to the library controller 908 and the titles of the books are downloaded to the  
14 catalog printer 916. For security reasons, the coded text for any of the electronic books  
15 may not be authorized for printing using the controller 908 and catalog printer 916. In  
16 order to maintain security over the data, none of the electronic book data may be allowed  
17 to be downloaded to the printer 916. Once a complete printout of available book titles,  
18 magazines, or other textual material is complete, a hard copy of the catalog 920 can be  
19 maintained at the file server 900.

20 The system shown may also be used at bookstores. The bookstores can rent the  
21 public viewer 912 to customers with the text for one or two books loaded onto the public  
22 viewer 912. The public viewer 912 may be provided with an automatic timeout  
23 sequence. The timeout sequence would erase the textual data for the books after a certain  
24 period of time, for example, two weeks. It is expected that after a period of time (perhaps  
25 within two weeks) the renter would return the public viewer 912 to the bookstore and  
26 receive additional books for viewing. Using this arrangement, it is also possible for the  
27 bookstore to (permanently) sell a viewer 912 to a regular customer. The customer then  
28 returns to the bookstore from time to time to receive textual data for a book which the  
29 customer can then store permanently on the customer's own viewer 912. Various other

1 configurations are possible for bookstores, schools and public libraries using the file  
2 server 900 and public viewer 912 described.

### 3 V. Use Of A Set Top Converter

4 Existing set top converter boxes such as those made by Scientific Atlanta or  
5 General Instruments are presently unequipped to handle the book selection system of the  
6 present invention. Although set top converters may be built which include the library  
7 functions, hardware modifications are necessary in order to use the book selection system  
8 with existing set top converter technology.

9 Figures 16a and 16b are examples of hardware modifications or upgrades. A port  
10 is used to attach hardware upgrades described below to a set top terminal. Two upgrades  
11 are possible to set top converters 601 to assist in receiving and selecting electronic books,  
12 a menu generation card upgrade (Figure 16a) and an information download unit (Figure  
13 16b). Each of these upgrades may be connected to the set top terminal unit through an  
14 upgrade port. A four wire cable, ribbon cable, FireWire (IEEE 1394B) interface  
15 connector, USB connector, or the like may be used to connect the upgrade to the set top  
16 converter 601.

17 A card addition 950 to a set top converter 601 is depicted in Figure 16a. The card  
18 950 shown provides the additional functionality needed to utilize the book selection  
19 system with existing set top converter 601 technology. The card 950 may be configured  
20 to slip inside the frame of a set top terminal and become part of the set top terminal, an  
21 advanced set top terminal. The primary functions the card 950 adds to the set top  
22 converter 601 are the interpreting of data signals, generating of menus, sequencing of  
23 menus, and, ultimately, the ability of the subscriber to select a book using either the  
24 television or a viewer 266. The card 950 also provides a method for a remote location,  
25 such as the cable headend, to receive information on books ordered. The books ordered  
26 information and control commands may be passed from the cable headend to the card 950  
27 using telephone lines or alternative ordering methods as presented in Section VII.

28 The primary components of the card 950 are a PC chip CPU 952, a VGA graphic  
29 controller 954, a video combiner 956, logic circuitry 958, NTSC encoder 960, a receiver

1 962, demodulator (not shown), and a connector 611', which consists of a dialer. The card  
2 950 operates by receiving the data text signal from the cable headend through the coaxial  
3 cable. The logic circuitry 958 of the card 950 receives data 964, infrared commands 966,  
4 and synchronization signals (not shown) from the set top converter 601. Menu selections  
5 made by the viewer 266 on the remote control are received by the set top converter's 601  
6 IR equipment and passed through to the card 950. The card 950 interprets the IR signal  
7 and determines the book (or menu) the subscriber has selected. The card 950 modifies  
8 the IR command to send the information to the set top converter 601. The modified IR  
9 command contains the channel information needed by the set top converter 601. Using  
10 the phone line 968 and dialer 611', the card 950 is able to transmit electronic books  
11 ordered information to the cable headend. It is also possible to receive the electronic  
12 books over the telephone lines and other telecommunications networks, including  
13 wireless networks, and by-pass the video distribution system.

14 These commands are passed through the interface linking the set top terminal's  
15 microprocessor with the microprocessor of the hardware upgrades. In this way,  
16 subscriber inputs, entered through the set top terminal keypad or remote control, can be  
17 transferred to any of the hardware upgrades for processing and responses generated  
18 therein can then be sent back to the set top terminal for display. In one embodiment the  
19 IR commands 966 are transferred from set top terminal 601 to hardware upgrade.

20 Hardware upgrades may include a microprocessor, interactive software,  
21 processing circuitry, bubble memory, and a long-term memory device. In addition to  
22 these basic components, the hardware upgrade may make use of an additional telephone  
23 modem or CD-ROM device.

24 An information download hardware upgrade 1001 shown in Figure 16b allows the  
25 subscriber to download large volumes of information from the operations center 250 or  
26 cable headend using a set top terminal 610. The hardware upgrade 1001 will enable  
27 subscribers to download data, such as electronic books and electronic magazines, to local  
28 storage. Primarily, the hardware upgrade 1001 is an additional local storage unit 1003  
29 (e.g., hard disk, floppy, optical disk or magnetic cartridge and may include a

1 microprocessor 1005, instruction memory 1007, and a random access memory 1009, as  
2 shown in Figure 16b). A small portable viewer may also provided with the upgrade 1001  
3 to enable downloaded text to be read without the use of a television.

4 The downloadable information may be text or graphics supplied by the operations  
5 center 250 or cable headend. With the upgrade 1001, electronic books may be  
6 downloaded and read anywhere with the viewer 266. Using the upgrade 1001, electronic  
7 books may be downloaded and stored in compressed form for later decompression. The  
8 electronic books may be decompressed only at the time of viewing. Important text that  
9 the public desires immediate access may made available through this system. Text such  
10 as the President's speech, a new law, or a recent abortion decision rendered by the  
11 Supreme Court may be made immediately available.

12 In one embodiment, electronic book ordering information is stored at each set top  
13 terminal 610 until it is polled by the cable headend using a polling request message  
14 format. An example of a polling request message format consists of six fields, namely:  
15 (1) a leading flag at the beginning of the message, (2) an address field, (3) a subscriber  
16 region designation, (4) a set top terminal identifier that includes a polling  
17 command/response (or P/F) bit, (5) an information field, and (6) a trailing flag at the end  
18 of the message. A similar response frame format for information communicated by the  
19 set top terminal to the cable headend in response to the polling request may be used.

20 Figure 17 shows components of a set top terminal 610'. The components include  
21 a data receiver 617' and a data transmitter 1011. The data transmitter provides upstream  
22 data communications capability between the set top terminal 610' and the cable headend.  
23 Upstream data transmissions are accomplished using the polling system described and,  
24 using a data transmitter 1011. Both receiver 617' and transmitter 1011 may be built into  
25 the set top terminal 610' itself or added through an upgrade module. Regardless of the  
26 specific hardware configuration, the set top terminal's data transmission capabilities may  
27 be accomplished using the hardware shown in Figure 17.

28 Figure 17 shows RF signals, depicted as being received by a data receiver 617'  
29 and tuner 613 working in unison. Both of these devices are interfaced with the

1 microprocessor 1013, which receives inputs 1015, from the subscriber, either through a  
2 set top terminal's keypad, a remote control unit or viewer 266. Generally, all cable  
3 signals intended for reception on the subscriber's TV are accessed by the tuner 613 and  
4 subsequently processed by the processing circuitry 1017. This processing circuitry 1017  
5 typically includes additional components (not shown) for descrambling, demodulation,  
6 volume control and remodulation on a Channel 3 or 4 TV carrier.

7 Data targeted to individual set top terminals is received by the data receiver 617'  
8 according to each set top terminal's specific address or ID. In this way, each addressable  
9 set top terminal 610' only receives its own data. The data receiver 617' may receive set  
10 top terminal 610' specific data in the information field of the signal frame described or  
11 on a separate data carrier located at a convenient frequency in the incoming spectrum.

12 The received data includes information regarding electronic books and menus  
13 available for selection. The subscriber may enter a series of commands 1015 using a  
14 keypad or remote control in order to choose an electronic book or menu. Upon receipt  
15 of such commands, the set top terminal's microprocessor 1013 instructs the tuner to tune  
16 to the proper frequency of the channel carrying data and subsequently instructs the  
17 processing circuitry 1017 to begin descrambling of this data.

18 Upon selection of an electronic book, the microprocessor 1013 stores any  
19 selection information in local memory (not shown) for later data transmission back to the  
20 cable headend. The set top terminal's microprocessor 1013 coordinates all CATV signal  
21 reception and also interacts with various upstream data transmission components.  
22 Typically, the data transmitter 1011 operates in the return frequency band between 5 and  
23 30 MHZ. In an alternative embodiment, the frequency band of 10 to 15 MHZ may be  
24 used. Regardless, however, of the frequency band used, the data transmitter 1011 sends  
25 information to the cable headend in the information field of the response frame described.  
26 Those skilled in the art will recognize that a number of variations and combinations of  
27 the above-described set top terminal hardware components may be used to accomplish  
28 upstream data transmissions.

## VI. Books-On-Demand System

The electronic book system 200 described may also be configured in a book-on-demand style. Figure 18a shows one example of a configuration for a book-on-demand system. A book on demand system requires more powerful two-way communications between the consumer's home, bookstore, school or public library and either the operations center 250 or a distribution site 1020 such as the cable headend. In one embodiment, this type of two-way communication can be provided by the hardware shown in Figure 17 and described above. Additional methods related to alternative communication paths are presented in Section VII.

Referring to Figure 18a, in a book-on-demand system, the subscriber selects the book to be download from an available menu of books (see for example Figures 14d and 14e). The data for menus of available books is usually sent to the subscriber location by the distribution site 1020. After the subscriber's menu selection, information about the subscriber selection (or request) is then communicated to either a distribution point 1020 (such as a cable headend) or the operations center 250. Upon receipt of this request, the needed textual and graphical information for the book is spooled and sent to the subscriber. In this manner, electronic books are only sent when requested by the subscriber and are sent immediately upon demand for the electronic book (or text).

In order to support such a demand system, the text delivery and distribution must be conducted on a strong nodal architecture distribution system, such as, a video-on-demand cable or telephone television system, through use of individual telephone calls on the public telephone system or cellular phone system, through the use of the Internet, or a number of other data network options.

The book-on-demand system allows for a greater selection of electronic books to the subscriber and limits the amount of communicated book data that is unnecessary or unneeded. It also provides the electronic book to the subscriber in a much timelier fashion.

In addition to a stronger distribution system, a book-on-demand system requires a distribution point 1020 to have more sophisticated equipment to access and "spool out"



1 the textual information. This can be accomplished using file server technology 1024 for  
2 storing the books and distribution technology such as ATM 1028 or telephone-type  
3 switching (not shown) to distribute the textual information. The file server 1024 and  
4 distribution technology that can be used in configuring such a book-on-demand system  
5 is described in U.S. Patent No. 5,262,875 and U.S. Patent 5,218,695, cited above.

6 Figure 18a shows an embodiment for a book-on-demand system that utilizes file  
7 server technology. In addition to books, the embodiment of Figure 18a will support  
8 distribution of nearly any digital data. Books or textual files are received from publishers  
9 282 and other sources through local feeds 1032, ATM 1028, or by satellite dish 1036, for  
10 example. The data is then stored in memory 1040 at the file server 1024. In one  
11 embodiment, the distribution point 1020 is a cable headend that receives requests from  
12 subscribers and delivers text to subscribers over a two-way communication system (such  
13 as a video-on-demand system (VOD) 1044).

14 The library 262 can be connected to either a basic premium-type service cable  
15 system 1048, a near video-on-demand type cable system (or pay-per-view (PPV) 1052)  
16 or a video-on-demand cable system 1044. In connecting with either of these three  
17 systems the library 262 may access the cable directly or may access the system through  
18 a set top terminal 601', 601'', or 601'''.  
19

20 Using the two-way video-on-demand system 1044, a subscriber is able to request  
21 a specific book title and receive that text immediately following its request. To  
22 accomplish this, the distribution point 1020 transmits a list of available books through  
23 the cable delivery system to the library 262. The library 262 displays the list of available  
24 books on a menu or similar format. As described earlier, the library 262 may use menus  
25 which list categories of available books to form its request from the distribution point  
26 1020. After selecting a book the library 262 then sends a request signal on the two-way  
27 communication system 1044 back to the distribution point 1020. This request signal can  
28 be handled in two ways. The library 262 either initiates the request or the distribution  
point 1020 polls the various libraries on to the two-way system 1044. Upon receiving the

1 request for the book title, the text associated with that book title is transmitted to the  
2 library 262 using the two-way cable system 1044.

3 Figure 18b is an expanded view of an operations center 250 that supports a  
4 regional or national book-on-demand system. In fact, the operations center 250 shown  
5 supports distribution of nearly any digital data. The operations center 250 supports  
6 multiple feeds to receive digital information by tape 1060, 1060', ATM 1028, or satellite  
7 1036. The information is processed through an input MUX 1064 and a small file server  
8 1068 before reaching the master file server 1072. Digital data such as books received  
9 from publishers 282 is then stored on the master file server 1072. The digital data may  
10 be stored compressed in a standard format such as MPEG2.

11 A system controller 1076 provides control over the regional or national book-on-  
12 demand system. Books may be packaged into groups to provide feeds to various cable  
13 headends. In addition, scheduling and marketing research are conducted at the operations  
14 center 250. In order to handle the scheduling and market research, book buy data is  
15 received at the operations center 250 through a multiplexer 1082. Book buy information  
16 can be provided by the operation center 250 to the billing and collection system 278.

17 The operations center 250 is also equipped to insert messages or advertisements  
18 into the file server. These messages or advertisements will eventually be received by the  
19 subscribers.

20 The master file server 1072 uses an output multiplexer 1080 and ATM 1028 as  
21 well as satellite connections to distribute digital data. In one embodiment, cable  
22 headends receive text data on books from the master file server 1080 through the output  
23 multiplexer 1028 and an ATM system 1028. After receiving the digital book data, the  
24 cable headends store the books in a local file server 1024. Figure 18a's distribution point  
25 1020 is an example of a cable headend which may receive data from the operations center  
26 250 of Figure 18b through an ATM hookup 1088 or satellite hookup.

## 27 VII. Alternative Delivery And Ordering Methods

28 Electronic books and related data, including electronic book menu data, may be  
29 provided to subscribers by use of an on-demand delivery system in which electronic

books are delivered after an order is received by the delivery system. The delivery system may supply the electronic books in real time or near-real time (i.e., near on-demand), or after a delay period that allows the delivery system to process, package and transmit the electronic book. Alternatively, the delivery system may broadcast one or more electronic books in a continuous fashion. In this alternative, the subscriber indicates a desired electronic book from a list of the broadcast electronic books. The delivery system may include a billing system that debits a subscriber's account, or debits a credit card, for example, upon delivery of the electronic book. The delivery system, or a related authorization system, may provide a local authorization code that allows the subscriber to decrypt, store and view the desired electronic book.

a. Use of TV Program Broadcast Delivery System for Electronic Book Delivery

i. Delivery System Description

In addition to advances in television broadcast technology, government regulatory agencies have placed requirements on the broadcast television industry. In particular, the over-the-air broadcast television networks will soon transition to high definition television (HDTV) - a digital broadcast television standard. These broadcasters may elect to provide a single HDTV digital signal in their allotted bandwidth, with the remaining bandwidth used for standard definition television (SDTV) digital programming. Alternatively, broadcasters may elect to make use of their bandwidth for data-related services, such as the delivery of electronic books.

This embodiment relates to an electronic book delivery system using a digital television program delivery system. This embodiment may be used in at least two domains: delivery of electronic books embedded in the broadcast digital multiplex signal using terrestrial, over-the-air media; and delivery of electronic books embedded in the broadcast digital multimedia signal over an existing cable television system. Over-the-air delivery includes standard terrestrial television broadcasts. Cable delivery systems include coaxial cable systems, fiber optic delivery systems, and telephone delivery systems (including T1 and T3 lines, Integrated Services Digital Network (ISDN) lines

1 and Asymmetric Digital Subscriber Lines (ADSL)). In addition, electronic books may  
2 be delivered within the broadcaster's signal by direct satellite broadcast, by wireless  
3 broadcasts, and by other wired means including local area networks.

4 Figure 19 shows a broadcast television environment 1100 in which a broadcast  
5 program provider, such as a national broadcaster 1110, provides digital multiplex  
6 television programming with embedded electronic book data 1111 to a broadcast affiliate  
7 1112. The programming with embedded electronic book data 1111 may be provided to  
8 the broadcast affiliate 1112 by any suitable means. For example, the national broadcaster  
9 1110 may provide the programming with embedded electronic book data 1111 by satellite  
10 transmission using a satellite broadcast system 1120. The satellite broadcast system 1120  
11 may include an uplink site 1121, a satellite 1122, and a downlink site 1123. The satellite  
12 broadcast system 1120 may transmit the programming with embedded electronic book  
13 data 1111 to the broadcast affiliate 1112 and directly to home systems 258', 258'', and  
14 258''' at remote locations such as subscribers' homes, for example.

15 The broadcast affiliate 1112 may provide digital multiplex television  
16 programming with embedded electronic book data 1115 to intermediate locations such  
17 as local cable system 1114. Alternately, the broadcast affiliates 1112 may provide the  
18 programming with embedded electronic book data 1115 directly to the subscriber's home  
19 systems 258', 258'', and 258'''. The local cable system 1114 that receives the  
20 programming with embedded electronic book data 1115 may in turn provide the  
21 programming with embedded electronic book data 1115 to the home systems 258', 258'',  
22 and 258'''.

23 The home systems 258', 258'', and 258''' may receive digital television signals  
24 from any device capable of receiving digital TV signals, including digital televisions,  
25 digital set top boxes and personal computers, or any combination of these devices, or  
26 home subsystems may have a built-in digital TV receiver. The home systems 258' 258'',  
27 and 258''' may receive the programming with embedded electronic book data 1115 by  
28 cable, including coaxial cable and fiber optic cable, by telephone cable (including T1 and  
29 T3 lines, Integrated Services Digital Network (ISDN) lines and Asymmetric Digital

Subscriber Lines (ADSL)). Alternately, the home systems 258', 258", and 258''' may receive the programming with embedded electronic book data 1111 directly from the national broadcaster 1110 using the satellite broadcast system 1120. For example, the home system 258''' receives direct broadcast satellite programming with embedded electronic book data using a backyard satellite antenna 1143.

Also coupled to the home systems 258', 258", and 258''' may be an Internet 1105. The Internet 1105 provides access to web sites such as the web site 279. The Internet 1105 may also connect to the billing and collection system 278, or operations center 250, which is responsible for formatting and delivering the electronic book data to the broadcast affiliate 1112 and the national broadcaster 1110 to be embedded into their respective program signals for delivery. The operations center 250 may use the Internet 1105 to post electronic book ordering menus, such as provided in the menu system 851 shown in Figure 13. The billing and collection system 278 may use the Internet 1105 to receive orders and payment for the purchases of electronic books. The electronic book ordering menu 851 may be provided as part of the broadcast from the national broadcaster 1110, the broadcast affiliate 1112, or the local cable system 1114. Alternatively, the electronic book ordering menu 851 may be downloaded from an Internet web site or alternately viewed directly on the Internet web site. The use of the Internet 1105 for these purposes will be described later in more detail.

In Figure 19, the national broadcaster 1110 may be a television program broadcaster. Alternately, the national broadcaster 1110 may be a radio program broadcaster, or a combined television and radio broadcaster. The national broadcaster 1110 may also broadcast any other type of data or communication, either separately or in combination. Likewise, the broadcast affiliate 1112 may broadcast television or audio or both and may also broadcast any other data or communication, either separately or in combination. The national broadcaster 1110 and the broadcast affiliate 1112 may broadcast analog signals and any type of digital signals including packet data. Digital data broadcast by the national broadcaster 1110 and the broadcast affiliate 1112 may include high definition television and standard definition television signals.

1           Figure 20 is a flowchart of steps involved in processing text from the publisher  
2 or provider 282 that may occur at the operations center 250. As shown in step S500, the  
3 publisher 282 processes data files of text for books, and compresses, encrypts and sends  
4 the data files to the operations center 250. Text files for books may be sent one book at  
5 a time. As shown in step S504, the operations center 250 receives and processes the data  
6 stream from the publisher 282. Part of this processing may include encryption and error  
7 correction and storage for future delivery purposes. Text files may be delivered for  
8 receipt by multiple home systems simultaneously, or to a specific individual home  
9 system.

10           In one embodiment, as shown in step S509, files are broken into smaller packets  
11 of information. Header information is added to the packets. The bit stream is converted  
12 from a serial digital bit stream to a digital stream that is compatible for insertion into the  
13 broadcaster's video/audio program multiplex signal. Step S513 shows the multiplexing  
14 of digital data into the appropriate data fields within the video/audio program multiplex.  
15 The digital data may be treated as an ancillary MPEG2 service, being placed into the  
16 multiplex as private data, carried either in the adaptation header of the MPEG2 transport  
17 packets or in a separate transport stream altogether. Step S513 also shows the operations  
18 center 250 performing the necessary modification to the industry standard MPEG  
19 Program Map Table and Program Specific Information.

20           ii.       In-Home Reception Options for a Broadcast Delivery System

21           Figures 21a – 21g show reception options at the remote locations such as at a  
22 subscriber's home. In Figure 21a, the home system 258 is coupled to a digital set top  
23 terminal 1220. The set top terminal 1220 receives the programming with embedded  
24 electronic book data 1115 from the broadcast affiliate 1112 or the local cable system  
25 1114. Alternately, the national broadcaster 1110 may provide the programming with  
26 embedded electronic book data by use of the satellite broadcast system 1120. In this  
27 alternative, the set top terminal 1220 would be coupled to a local, or backyard, satellite  
28 dish antenna or similar device. In yet another alternative, the set top terminal 1220

1 receives programming from both the satellite broadcast system 1120, the local cable  
2 system 1114, and directly from the broadcast affiliate 1112 using terrestrial broadcast.

3 Also shown in Figure 21a is a telephone 1178 that may be used to communicate  
4 with the billing and collection system 278, and a personal computer (PC) 1172 and a  
5 modem 1173 that may be used to communicate with the Internet 1105. The personal  
6 computer 1172 may be coupled to the set top terminal 1220 using signal path 1174. The  
7 signal path 1174 may include a cable connection such as a RS-232 cable, USB format  
8 interface, Firewire interface, and connectors or by wireless means, such as infrared  
9 signaling and radio frequency signaling, for example.

10 The set top terminal 1220 performs the necessary processing to send the  
11 programming with embedded electronic book data 1115 to the home system 258. The  
12 set top terminal 1220 may demultiplex the programming with embedded electronic book  
13 data 1115 and supply the demultiplexed signal to the home system 258. To do this, the  
14 set top terminal 1220 extracts the data related to the electronic book from the digital  
15 program multiplex signal.

16 The set top terminal 1220 may receive commands from a remote control 1900.  
17 The set top terminal 1220 may include communication devices 1221 that allow reception  
18 and transfer of data with external sources such as the Internet 1105. For example, the set  
19 top terminal 1220 may include a telephone modem, a cable modem, a wireless modem,  
20 a fiber optic connector, a LAN connector, or any combination of these devices. Using  
21 this connection to the Internet 1105, the set top terminal 1220 and PC 1172 may access  
22 the billing and collection system 278 or alternatively connect to the Internet 1105 to  
23 access the Internet web site 279 to view electronic book ordering menus 851 provided by  
24 the operations center 250.

25 The set top terminal 1220 has input and output ports for communication with  
26 other local and remote devices. Although the local cable system 1114 or terrestrial  
27 broadcast methods are the most prevalent transmission mediums for delivering  
28 programming with embedded electronic book data to the home, telephone lines  
29 (including T1 and T3 lines, Integrated Services Digital Network (ISDN) lines and

Asymmetric Digital Subscriber Lines (ADSL)), cellular networks, fiber optics, local area networks, Personal Communication Networks, and analog and digital satellites and similar technology for transmitting to the home can be used interchangeably. The set top terminal 1220 may have output ports that provide communications from the set top terminal 1220 to the home system 258 and a television. Also, the set top terminal 1220 may contain a phone jack that can be used for maintenance, trouble shooting, reprogramming and additional customer features. The phone jack may also be used to connect the set top terminal 1220 with the Internet 1105 for the purpose of ordering electronic books. Alternately, the set top terminal may support other communication interfaces using the appropriate interface device connector. The electronic book data embedded within the programming 1115 contains data, such as the electronic book ordering menu 851 information, to advise the subscriber which electronic books are available for purchase. Once the electronic book ordering menus 851 have been received by the home system 258, the home system 258 can generate the appropriate menus. Alternately, menu retrieval or viewing and electronic book selecting and ordering may be achieved using the Internet web site 279 on the Internet 1105, which is accessed using the provided modem interface.

Figure 21b shows an alternate arrangement of components for receiving the broadcast digital programming with embedded electronic book data 1115 and providing it to a home system 258. In Figure 21b, the digital television 1171 is coupled to the broadcast affiliate 1112 to receive the programming 1115. The digital television 1171 may also receive the programming with embedded electronic book data 1115 from the local cable system 1114 or from the satellite broadcast system 1120.

The digital television 1171 may include an optional smart card 1180 that performs the functions described above for the set top terminal 1220. For example, the smart card 1180 may include a cable modem, a telephone modem, a wireless modem, a fiber optic connector, or a LAN connector. Also shown in Figure 21b is the personal computer 1172 and the modem 1173, which function as before to connect to the Internet 1105. The functions of the digital television 1171 may be controlled by the remote control 1900,



1 using either infrared signals or radio frequency signals, for example. Using this  
2 connection to the Internet 1105, the television 1171 and PC 1172 may access the billing  
3 and collection system 278 or alternatively connect to the Internet 1105 to access the web  
4 site 279 to view electronic book ordering menus 851 provided by the operation center  
5 250.

6 Figure 21c shows another arrangement of components for receiving the broadcast  
7 digital programming with embedded electronic book data 1115. In Figure 21c, a digital  
8 television 1171' incorporating the smart card 1180 receives the programming with  
9 embedded electronic book data 1115 from the local cable system 1114 and performs all  
10 the functions of the library 262 described previously, including connecting to the viewer  
11 266. The television 1171' could also receive the programming with embedded electronic  
12 book data 1115 using other media including direct satellite broadcast, fiber optic  
13 connections, local area networks, such as an ethernet, the Plain Old Telephone Service  
14 (POTS), other telephone delivery systems (including T1 and T3 lines, Integrated Services  
15 Digital Network (ISDN) lines and Asymmetric Digital Subscriber Lines (ADSL)) and by  
16 over-the-air broadcast from the broadcast affiliate 1112. The television 1171',  
17 incorporating the smart card 1180, includes some or all of the functionality of the  
18 personal computer 1172 shown in Figure 21b, for example. The television 1171'  
19 connects to the Internet 1105 and is able to access the web site 279 to view electronic  
20 book ordering menus 851 provided by the operations center 250. The remote control  
21 1900 may be used to control the television 1171' and library 262. The television 1171'  
22 may also, in its programming, include a soft key board 1174 that is displayed on the  
23 display of the television 1171'. The remote control 1900 can then be used to operate  
24 "soft keys" on the soft key board 1174. The television 1171' may also incorporate a  
25 separate key board 1174' that is used to control the television 1171' and the library 262  
26 and to operate the television 1171' in its personal computer role. The key board 1174'  
27 may be connected to the television 1171' by a wired connection. Alternately, the key  
28 board 1174' may communicate with the television 1171' and library 262 by wireless  
29 means including infrared signaling, radio frequency signaling and by other optical means

1 including a laser. The television 1171' and library 262 may connect to a telephone  
2 system using signal path 1154.

3 Figure 21d shows yet another arrangement of components for receiving the  
4 broadcast digital programming with embedded electronic book data 1115. In Figure 21d,  
5 a digital television 1171' incorporating a smart card that functions as a complete  
6 electronic book home system 258 receives the programming with embedded electronic  
7 book data 1115 from the local cable system 1114 and performs all the functions of the  
8 home system 258 described previously, and displays the electronic book data on the  
9 television display. The television 1171' could also receive the programming with  
10 embedded electronic book data 1115 using other media including direct satellite  
11 broadcast, fiber optic connections, local area network, such as an ethernet, the POTS,  
12 other telephone delivery systems (including T1 and T3 lines, Integrated Services Digital  
13 Network (ISDN) lines and Asymmetric Digital Subscriber Lines (ADSL)) and by over-  
14 the-air broadcast from the broadcast affiliate 1112. The television 1171', incorporating  
15 the home system 258 functionality, may include some or all of the functionality of the  
16 personal computer 1172 shown in Figure 21b, for example. The television 1171'  
17 connects to the Internet 1105 and is able to access the web site 279 to view electronic  
18 book ordering menus 851 provided by the operations center 250. The remote control  
19 1900 may be used to control the television 1171' and home system 258. The television  
20 1171' may also, in its programming, include a soft keyboard 1174 that is displayed on the  
21 display of the television 1171'. The remote control 1900 can then be used to operate  
22 "soft keys" on the soft keyboard 1174. The television 1171' may also incorporate a  
23 separate keyboard 1174' that is used to control the television 1171' and home system 258  
24 and to operate the television 1171' in its personal computer role. The keyboard 1174'  
25 may be connected to the television 1171' by a wired connection. Alternately, the  
26 keyboard 1174' may communicate with the television 1171' and home system 258 by  
27 wireless means including infrared signaling, radio frequency signaling and by other  
28 optical means including a laser. The television 1171' and home system 258 may connect  
29 to a telephone system using signal path 1154.

1           Figure 21e shows another arrangement of components for receiving the broadcast  
2 digital programming with embedded electronic book data 1115. In Figure 21e, a PC 1172  
3 with digital TV receiver incorporating the smart card 1180 receives the programming  
4 with embedded electronic book data 1115 from the local cable system 1114 and performs  
5 all the functions of the library 262 described previously, including connecting to a viewer  
6 266. The PC 1172 could also receive the programming with embedded electronic book  
7 data 1115 using other media including direct satellite broadcast, fiber optic connections,  
8 local area network, such as an ethernet, the POTS, other telephone delivery systems  
9 (including T1 and T3 lines, Integrated Services Digital Network (ISDN) lines and  
10 Asymmetric Digital Subscriber Lines (ADSL)) and by over-the-air broadcast from the  
11 broadcast affiliate 1112. The PC 1172 connects to the Internet 1105 and is able to access  
12 the web site 279 to view electronic book ordering menus 851 provided by the operations  
13 center 250.

14           Figure 21f shows another arrangement of components for receiving the broadcast  
15 digital programming with embedded electronic book data 1115. In Figure 21f, the PC  
16 1172 with digital TV receiver incorporating a smart card that functions as a complete  
17 electronic book home system 258 receives the programming with embedded electronic  
18 book data 1115 from the local cable system 1114 and performs all the functions of the  
19 home system 258 described previously. The PC 1172 could also receive the  
20 programming with embedded electronic book data 1115 using other media including  
21 direct satellite broadcast, fiber optic connections, local area network, such as an ethernet,  
22 the POTS, other telephone delivery systems (including T1 and T3 lines, Integrated  
23 Services Digital Network (ISDN) lines and Asymmetric Digital Subscriber Lines  
24 (ADSL)) and by over-the-air broadcast from the broadcast affiliate 1112. The PC 1172  
25 connects to the Internet 1105 and is able to access the web site 279 to view electronic  
26 book ordering menus 851 provided by the operations center 250.

27           Figure 21g shows another arrangement of components for receiving the broadcast  
28 digital programming with embedded electronic book data 1115. In Figure 21g, the home  
29 system 258 contains a digital TV receiver 1613 to receive the programming with

1 embedded electronic book data 1115 from the local cable system 1114. The home system  
2 258 connects to the Internet 1105 and is able to access the web site 279 to view electronic  
3 book ordering menus 851 provided by the operations center 250.

4 Figure 22 presents the hardware configuration of a home system 258 to support  
5 delivery of electronic books using the TV program broadcast delivery system. The home  
6 system 258 in Figure 22 includes a home system front end 259 and home system backend  
7 259'. The home system front end 259 can vary based on the delivery system from which  
8 electronic book data is being received. The home system backend 259' and its associated  
9 components and functionality are consistent regardless of the delivery system used and  
10 are as described in Section II above. The home system front end 259 performs several  
11 functions, such as receiving digital data directly, or receiving TV program broadcast  
12 signals, and stripping (or extracting) the data from the signal. Various hardware  
13 configurations may be utilized to achieve the desired functions of the home system front  
14 end 259. For example, as shown in Figure 22, the home system 258 can be configured  
15 to receive digital program multiplexes from the set top terminal 1220, from the TV 1171,  
16 or from the computer 1172 using the connector 1617. Alternatively, the home system  
17 258 can receive the RF channel in which the digital program multiplex signal is contained  
18 using the digital TV receiver 1613 and provide the signal to a digital program broadcast  
19 connector 1617 to extract the electronic book data from the signal. Finally, the home  
20 system 258 can receive a digital data stream, which has already been extracted from the  
21 digital program multiplex, using a connector 1619. Once the digital data that is related  
22 to the electronic book system has been extracted from the TV program broadcast signal,  
23 the digital data is provided to the digital logic 609 in the home system 258 for continued  
24 processing, as described in Section II.

25 To receive and strip the data from the digital TV program signal at the consumer's  
26 home, the connector 1617 is used. Figure 23 is a flowchart of processes performed by  
27 the connector 1617. The connector 1617 receives the digital program multiplex signal  
28 in step S1607, removes the MPEG control information from the signal in step S1608,  
29 determines if the stream contains any electronic book data embedded within it in step

1 S1612, extracts the electronic book data from the signal in step S1616, and communicates  
2 the extracted electronic book data stream to digital logic components 609 in step S1620.

3 iii. Electronic Book Ordering Process for TV Program Broadcast  
4 Delivery

5 As described in Section II above, a subscriber selects their desired electronic book  
6 from a menu system. This menu system and its contents are updated by the operations  
7 center 250 using information delivered to the home system 258 either periodically  
8 distributed over the TV program broadcast delivery system, or delivered to the home  
9 system 258 by the billing and collection system 278 upon ordering a new electronic book.  
10 Order requests for electronic books made from this menu are forwarded to the billing and  
11 collection system 278 for processing.

12 In the case where the delivery is done using a two-way cable system, the set top  
13 terminal 1220 can be used to convey order request information to the local cable system  
14 1114. The local cable system 1114 will in turn be in communication with the billing and  
15 collection system 278 or the operations center 250 that handle requests from the set top  
16 terminal 1220 for electronic book ordering or billing purposes. Further, telephone lines  
17 with modems may be used to transfer information from the set top terminal 1220 to the  
18 billing and collection system 278 or the operations center 250. Alternately, the set top  
19 terminal 1220 may incorporate a cable modem, a wireless modem, LAN connectors, T1  
20 and T3 connectors, Asymmetric Digital Subscriber Line (ADSL) Connectors, Integrated  
21 Digital Service Network (ISDN) connectors or other advanced communications interfaces  
22 for transmitting information to the cable system 1114 or over alternate communication  
23 paths directly to the billing and collection system 278 or the operations center 250.  
24 Alternatively, the home system 258 may contact the billing and collection system 278  
25 directly over any of these communication paths.

26 Figures 24a - 24c show alternate arrangements of an ordering process that can be  
27 used with the programming with embedded electronic book data 1111 or 1115. In the  
28 discussion that follows, the subscriber receives the programming with embedded  
29 electronic book data 1115 from the local cable system 1114. However, the order process

1 may also be used when the programming with embedded electronic book data 1115 is  
2 provided by the broadcast affiliate 1112 or the satellite broadcast system 1120, or from  
3 any other entity capable of providing digital broadcast programming with embedded  
4 electronic book data.

5 In Figures 24a - 24c, electronic book order requests may be provided over a  
6 variety of telecommunications media including using a cable modem to the billing and  
7 collection system 278; over a proprietary two-way transmission system to the billing and  
8 collection system 278; over a fiber optic cable system to the billing and collection system  
9 278; using a telephone modem to the billing and collection system 278, using existing  
10 telephone lines; using a cellular modem over wireless telecommunication systems; using  
11 T1 and T3 lines, Asymmetric Digital Subscriber Lines, Integrated Digital Services  
12 Network lines, and using a telephone and the POTS. Alternately, the electronic book  
13 order requests may also be provided over a LAN, such as an ethernet.

14 In Figure 24a, the national broadcaster 1110 provides the programming with  
15 embedded electronic book data 1111 to the broadcast affiliate 1112. The broadcast  
16 affiliate 1112 sends the programming with embedded electronic book data 1115 to the  
17 local cable system 1114. The local cable system 1114 sends the programming with  
18 embedded electronic book data 1115 to the home system 258. To receive the requested  
19 electronic book from the programming with embedded electronic book data at the home  
20 system 258, the subscriber may initiate an order request. In the embodiment shown in  
21 Figure 24a, the subscriber sends an order request 1190 to the billing and collection  
22 system 278, which then initiates the delivery of the requested electronic book data from  
23 the operations center 250 for inclusion in the programming.

24 Electronic books may also be received at the home system 258 without the  
25 subscriber providing the order request. Another subscriber may provide an electronic  
26 book for delivery to the home system 258 as a gift, for example. Electronic books also  
27 may be sent to the home system 258 on a trial, or approval basis. For example, a trial  
28 electronic book may be sent to a home system 258 on a trial basis and the trial electronic  
29 book could include a code that prevents viewing after a set, elapsed time from receipt at

1 the home system 258. To retain viewing privileges for the trial electronic book, the  
2 subscriber could indicate a desire to purchase the trial electronic book. The operations  
3 center 250 would then return an authorization code that permits the subscriber to retain  
4 the trial electronic book on a permanent basis. Alternatively, the delivery system 200  
5 could provide a portion of an electronic book, in an unencrypted format, such as the first  
6 chapter, and the subscriber would have to purchase the electronic book to receive the  
7 authorization code to decrypt the remainder of the electronic book.

8 Figure 24b shows an alternate arrangement of the ordering process. The ordering  
9 process shown in Figure 24b differs from that shown in Figure 24a in that an order  
10 request 1190' is sent to the billing and collection system 278, which then initiates  
11 delivery of the electronic book data for insertion by the broadcast affiliate 1112.

12 Figure 24c shows yet another arrangement of the ordering process. In Figure 24c,  
13 an order request 1190" is sent to the billing and collection system 278, which then  
14 initiates delivery of the electronic book data for insertion by the national broadcaster  
15 1110.

16 b. Operation of the Ordering System Using the Internet

17 In the one-way delivery environment typified by the TV program broadcast  
18 delivery environment, the use of the Internet can provide ubiquitous access to subscribers  
19 for ordering electronic books. The subscriber may log on to the Internet web site 279,  
20 using the PC 1172 of Figures 21a, 21b, 21e, or 21f, or the television 1171' of Figures 21c  
21 or 21d, or the home system 258 of Figure 21g. The subscriber may then enter a  
22 subscriber identification. The Internet web site 279 may then present an individualized  
23 menu to the subscriber. The subscribers may view the individualized menu on the PC  
24 1172, television 1171' or home system 258, for example. The individualized menu may  
25 be based on subscriber specific data, such as past electronic books ordered, for example.

26 When the electronic book ordering is performed on the Internet web site 279, the  
27 Internet web site 279 may also recognize the subscriber 285, based on the subscriber's  
28 automatic number identification (ANI), user name, user identification, and Internet  
29 address (i.e., REMOTE\_HOST, REMOTE\_ADDR, and HTTP\_NAME), for example.

1 The subscriber may also be identified by a unique subscriber identifier that is provided  
2 to the subscriber upon subscribing to a broadcast television service. Other means for  
3 identifying a subscriber include special features such as browser cookies. A browser  
4 cookie is a mechanism that allows a web site server to store limited amounts of  
5 information on a browser. The information is typically information sent to a subscriber's  
6 terminal using a Set-cookie HTTP response field header. The Set-cookie field contains  
7 the cookie content as a name/value pair, and can also contain information explaining  
8 when the cookie will no longer be valid (expires), the Internet domain for which the  
9 cookie is valid (domain), and the path portion of the URL within this domain for which  
10 the cookie is valid. Browsers that understand cookies will store the data on the set top  
11 terminal's hard disk, for example, and will return these data to the web site server from  
12 which the cookie originated within a cookie request header field. Cookies are useful for  
13 storing state information (when the subscriber last visited the web site, which resources  
14 the subscriber last used, for example) on the browser, in such a way that the information  
15 is not lost when the subscriber leaves the web site or shuts down the browser.

16 A web site, such as the web site 279, may use cookies to customize electronic  
17 book ordering for the subscriber. For example, the web site 279 may welcome a  
18 subscriber to the web site 279, based on the information in the cookie, and may navigate  
19 the subscriber to a menu, or individualized menu, based on previous orders provided by  
20 the subscriber. When the subscriber is identified, the web site 279 may create the  
21 individualized order menu, which the specific subscriber may download to the home  
22 system 258.

23 Once an order for an electronic book has been made, the billing and collection  
24 system 278 processes the order and initiates a request to the operations center 250 for the  
25 delivery of the requested electronic book for delivery over the TV program broadcast  
26 delivery system.

27 Figure 25 is a flow chart of the major steps associated with ordering an electronic  
28 book using the Internet. The flow chart assumes the broadcast environment of Figure 19.



1           The process begins with step S100. In step S110, the PC 1172 of Figures 21a,  
2           21b, 21e, or 21f, or the television 1171' of Figures 21c or 21d, or the home system 258  
3           accesses the web site 279. The web site 279 may be accessed by entering the address of  
4           the web site 279 into a location window of a web browser, by activating a hypertext link  
5           provided on the home system 258 menu or within an actual electronic book being viewed  
6           in the viewer 266, or by activating a hypertext link received from a different web site.  
7           The process then moves to step S120.

8           In step S120, a data signal showing the web site 279 home page is transmitted to  
9           the set top terminal 220, and the web site 279 home page is displayed on the requesting  
10          device. The process then moves to step S130. In step S130, the web site 279 receives  
11          the order signal 1190 for an electronic book selected by a subscriber. The order signal  
12          1190 includes an electronic book identifier and the address and identification of the  
13          requesting home system 258. The process then moves to step S140.

14          In step S140, the web site 279 transmits the authorization request 1196 to the  
15          billing and collection system 278. The process then moves to step S150. In step S150,  
16          the billing and collection system 278 determines if the home system 258 from which the  
17          order signal 1190 originated is authorized to receive the selected electronic book. The  
18          billing and collection system 278 may evaluate the past credit history of the requesting  
19          subscriber. The billing and collection system 278 may determine if the subscriber's  
20          account is delinquent. If the home system 258 is not authorized to receive the selected  
21          electronic book, the process moves to step S160. Otherwise, the process moves to step  
22          S170.

23          In step S160, the billing and collection system 278 sends a message to the  
24          requesting home system 258 stating that the selected program cannot be accessed, along  
25          with the reason for no access. The process then moves to step S190 and ends.

26          In step S170, the billing and collection system 278 sends an authorization signal  
27          1191 to the operations center 250. The process then moves to step S180. In step S180,  
28          the operations center 250 retrieves and embeds the requested electronic book data within  
29          the programming. The process then moves to step S190 and ends.

1 The method of ordering electronic books using the Internet is not limited to the  
2 TV program broadcast delivery embodiment. This ordering method is general in nature  
3 and may be used for ordering electronic books to be delivered using any of the delivery  
4 methods presented herein.

5 c. Internet Delivery Methods

6 Figure 26 is an alternate delivery plan 301' that provides for electronic book  
7 delivery using the Internet. In Figure 26, the publishers 282 provide the electronic books  
8 to be posted at the Internet web site 279. The publishers may convert the text and  
9 graphical data to digital format, compress the digital data, and upload the compressed  
10 digital data to the Internet web site 279. Alternately, the publishers 282 may arrange for  
11 an outside conversion activity 283 to convert the text and graphical data to digital format.  
12 The conversion activity 283 may then provide the digital data to the Internet web site 279.  
13 For example, a large on-line bookstore could gather publications in electronic form from  
14 a variety of publishers, or could convert hard-copy books to electronic form, and post the  
15 electronic books on the Internet such as at the Internet web site 279.

16 The electronic books may then be transferred using a public switched telephone  
17 network (PSTN), for example, or other communications systems, direct to a subscriber  
18 285, a library 286 and a bookstore 287. The library 286 and the bookstore 287 may also  
19 provide electronic books to the subscriber 285.

20 When electronic books are provided by the Internet web site 279, the billing and  
21 collecting functions may be incorporated into the Internet web site 279. For example, a  
22 subscriber may pay for an electronic book selection by entering a credit card number into  
23 a data field of a page of the Internet web site 279. In this configuration, a separate billing  
24 and collection system may not be required. Alternatively, the Internet web site 279 may  
25 communicate information with the billing and collection system 278.

26 Electronic book delivery over the Internet may be handled using a number of  
27 methods. In a method, the electronic book may be downloaded to the requesting home  
28 system 258 immediately after the order has been processed. Alternatively, the electronic  
29 book may be e-mailed to an e-mail address that is entered as part of the ordering process.

1 In another embodiment, as part of the ordering transaction process, the subscriber is  
2 provided with location and authorization information that allows the subscriber to  
3 retrieve the ordered electronic book at the subscriber's convenience. For delivery of  
4 subscription electronic book products, like newspapers, magazines or other periodicals,  
5 the Internet web site 279 can deliver the latest version of the product to the subscriber  
6 automatically immediately upon logon by the subscriber to the Internet web site 279.  
7 Electronic book data may also be embedded into continuous multicast streaming video,  
8 audio, or data feeds.

9 d. Other Delivery Methods

10 A number of embodiments for the delivery of electronic books have been  
11 addressed above. This subsection calls out these specific delivery embodiments, as well  
12 as presents other delivery embodiments supported by this invention. Section I presented  
13 a description of the operations center 250 and the uplink 254 used to transmit the  
14 electronic book data over the video distribution system 208, using the use of an encoder  
15 204. The embodiments presented below use a modular encoder 2541, which inserts the  
16 electronic book text into the delivered signal and modular transmission subsystem 2542,  
17 which transmits the actual signal. Together, the modular encoder 2541 and modular  
18 transmission subsystem 2542 support the transmission functionality for each unique  
19 delivery method embodiment. Section II presented a video connector 212 used to convert  
20 the electronic book data embedded in the video signal to a format usable by the home  
21 subsystem. The embodiments presented below use a modular connector 700 that receives  
22 the delivered signal with embedded electronic book data, extracts the electronic book  
23 data, and provides the electronic book data to the digital logic 609 for further processing.  
24 The modular connector 700 supports the receive functionality for each unique delivery  
25 method embodiment.

26 Figure 27 presents embodiments associated with the delivery of electronic books  
27 over a coaxial or fiber cable system 2701 to a home system 1258. Electronic book data  
28 is encoded for delivery by the modular encoder 2541, which is identical to the encoder  
29 174 in Figure 1b and formatted and transmitted by the modular transmission subsystem

2542, which is identical to the uplink 254 in Figure 4. The signal is delivered over the cable system 2701. This signal may provide for the dedicated or non-dedicated delivery of electronic book data. This signal may also provide for ordering access from the home system 1258 to the billing and collection system 278 or operations center 250, or the signal may be a means to provide access to the Internet or other public network through which electronic books are ordered and delivered. The cable system 2701 may be a coaxial cable network, totally fiber network, hybrid fiber coax network, fiber to the curb network, or any other cable distribution technology. The signal over the cable system may be generated by a cable modem; in which an external cable modem 2702 is used to receive the signal and provide the embedded electronic book data to the home system 1258 modular connector 700 for processing. Alternatively, the home system 1258 may contain an internal cable modem 2705 which receives the signal and provides the electronic book data to the modular connector 700 for processing. In each embodiment, the modular connector 700 provides the embedded electronic book data to the digital logic 609 for further processing.

In another embodiment, the signal delivered over the cable system is a video signal. In one embodiment, the video signal is an analog video signal. In another embodiment, the video signal is a digital video signal. The home system 1258 may contain an internal cable receiver / tuner / demodulator 2706 to process the signal, and provide the embedded electronic book data to the modular connector 700, which is identical in the embodiment as video connector 212 in Figure 2. A set top terminal 2703, or other device capable of receiving a cable video signal, such as a cable ready TV, or PC with cable tuner (not shown), may process the video signal and deliver the video signal to the connector 700 in the home system 1258 which extracts the embedded electronic book data. Alternately, the set top terminal 2703, or other such device, may extract the embedded electronic book data from the video signal and provide the electronic book data to the modular connector 700 in the home system 1258.

In another embodiment, electronic book data may be embedded within the audio signal, requiring an appropriate audio-capable modular connector 700 in the home system

1 1258 to extract the electronic book data from the audio signal for processing by the  
2 digital logic 609. In one embodiment, the audio signal is an analog audio signal. In  
3 another embodiment, the audio signal is a digital audio signal.

4 In yet another embodiment, the signal is a spread spectrum signal containing a  
5 digital data stream, requiring an appropriate spread spectrum receiver and modular  
6 connector 700 in the home system 1258 to extract the electronic book data for processing  
7 by the digital logic 609. In this embodiment, the spread spectrum signal is transmitted  
8 in the same bandwidth as the video or audio signal, but below the noise level.

9 Figure 28 presents embodiments associated with the delivery of electronic books  
10 over a wireless broadcast system 2801 to a home system 1260. Electronic book data is  
11 encoded for delivery by the modular encoder 2541 and formatted and transmitted by the  
12 modular transmission subsystem 2542. The signal is delivered over the wireless  
13 broadcast system 2801. This signal may provide for the dedicated or non-dedicated  
14 delivery of electronic book data. This signal may also provide for ordering access from  
15 the home system 1260 to the billing and collection system 278 or operations center 250,  
16 or the signal may be a means to provide access to the Internet or other public network  
17 through which electronic books are ordered and electronic book data is delivered. The  
18 wireless broadcast system may be a microwave multipoint delivery system (MMDS),  
19 local multipoint distribution system (LMDS), Instructional Television Fixed Service  
20 (ITFS) system, or any other wireless data, video, or telephony broadcast system, including  
21 point-to-point and point-to-multipoint microwave broadcast systems like those provided  
22 by Teligent, Winstar digital wireless network, and ATT's wireless system. The signal  
23 over the wireless broadcast system may be generated by a wireless modem, in which an  
24 external wireless modem 2802 is used to receive the signal and provide the embedded  
25 electronic book data to the home system 1260 modular connector 700 for processing.  
26 Alternatively, the home system 1260 may contain an internal wireless modem 2805,  
27 which receives the signal and provides the electronic book data to the home system 1260  
28 modular connector 700 for processing. In each embodiment, the modular connector 700

1 provides the embedded electronic book data to the digital logic 609 for further  
2 processing.

3 In another embodiment, the signal delivered over the wireless broadcast system  
4 is a video signal. In one embodiment, the video signal is an analog video signal. In  
5 another embodiment, the video signal is a digital video signal. The home subsystem  
6 1260 may contain an internal wireless receiver / tuner / demodulator 2806 to process the  
7 signal, and provide the embedded electronic book data to the modular connector 700. A  
8 wireless set-top terminal 2803, or other device capable of receiving a wireless video  
9 signal, such as a TV, or PC with a wireless receiver and tuner, may process the video  
10 signal and deliver the video signal to the modular connector 700 in the home system  
11 1260, which extracts the embedded electronic book data. Alternately, the set top terminal  
12 2803, or other such device, may extract the embedded electronic book data from the  
13 video signal and provide the data to the modular connector 700 in the home system 1260.

14 In another embodiment, electronic book data may be embedded within the audio  
15 signal, requiring an appropriate audio-capable modular connector 700 in the home system  
16 1260 to extract the electronic book data from the audio signal for processing by the  
17 digital logic 609. In one embodiment, the audio signal is an analog audio signal. In  
18 another embodiment, the audio signal is a digital audio signal.

19 In yet another embodiment, the signal is a spread spectrum signal containing a  
20 digital data stream, requiring an appropriate spread spectrum receiver modular connector  
21 700 in the home system 1260 to extract the electronic book data for processing by the  
22 digital logic 609. In this embodiment, the spread spectrum signal is transmitted in the  
23 same bandwidth as the video or audio signal, but below the noise level.

24 Figure 29 presents embodiments associated with the delivery of electronic books  
25 over a satellite broadcast system 2901 to a home system 1280. Electronic book data is  
26 encoded for delivery by the modular encoder 2541 and formatted and transmitted by the  
27 modular transmission subsystem 2542. The signal is delivered over the satellite  
28 broadcast system 2901. This signal may provide for the dedicated or non-dedicated  
29 delivery of electronic book data. This signal may also provide for ordering access from

1 the home system 1280 to the billing and collection system 278 or operations center 250,  
2 or the signal may be a means to provide access to the Internet or other public network  
3 through which electronic books are ordered and electronic book data is delivered. The  
4 satellite broadcast system 2901 can be a direct broadcast system like DirecTV and  
5 EchoStar, a direct to home satellite broadcast system, video network distribution  
6 broadcast system, a point-to-point or point-to-multipoint data VSAT system, a digital  
7 audio broadcast system like WorldSpace, CD Radio, or XM, or a mobile data and  
8 telephony satellite broadcast system like Iridium, Teledesic, or Globalstar. Alternatively,  
9 the satellite broadcast system can consist of regionalized broadcast services or store and  
10 forward communication services hosted on high flying balloons or on airplanes that  
11 provide communication repeater services to a small geographic region. The signal over  
12 the satellite broadcast system may be generated by a satellite data modem, in which an  
13 external satellite data receiver 2902 is used to receive the signal and provide the  
14 embedded electronic book data to the home system 1280 modular connector 700 for  
15 processing. Alternatively, the home system 1280 may contain an internal satellite  
16 receiver 2905 which receives the signal and provides the electronic book data to the home  
17 system 1280 modular connector 700 for processing. In each embodiment, the modular  
18 connector 700 provides the embedded electronic book data to the digital logic 609 for  
19 further processing.

20 In another embodiment, the signal delivered over the satellite broadcast system  
21 is a video signal. In one embodiment, the video signal is an analog video signal. In  
22 another embodiment, the video signal is a digital video signal. The home system 1280  
23 may contain an internal satellite video receiver 2906 to process the signal, and provide  
24 the embedded electronic book data to the modular connector 700. A satellite receiver  
25 2903, or other device capable of receiving a satellite video signal, such as a TV, or PC  
26 with satellite receiver, may process the video signal and deliver the video signal to the  
27 modular connector 700 in the home system 1280, which extracts the embedded electronic  
28 book data. Alternately, the satellite receiver 2903, or other such device, may extract the

1 embedded electronic book data from the video signal and provide the data to the modular  
2 connector in the home system 258.

3 In another embodiment, electronic book data may be embedded within the audio  
4 signal, requiring an appropriate audio-capable modular connector 700 in the home system  
5 1280 to extract the electronic book data from the audio signal for processing by the  
6 digital logic 609. In one embodiment, the audio signal is an analog audio signal. In  
7 another embodiment, the audio signal is a digital audio signal.

8 In yet another embodiment, the signal is a spread spectrum signal containing a  
9 digital data stream, requiring an appropriate spread spectrum receiver modular connector  
10 700 in the home system 1280 to extract the electronic book data for processing by the  
11 digital logic 609. In this embodiment, the spread spectrum signal is transmitted in the  
12 same bandwidth as the video or audio signal, but below the noise level.

13 Figure 30 presents embodiments associated with the delivery of electronic books  
14 over a wired data network 3001 to a home system 1290. Electronic book data is encoded  
15 for delivery by the modular encoder 2541 and formatted and transmitted by the modular  
16 transmission subsystem 2542. The signal is delivered over the wired data network 3001.  
17 This signal may provide for the dedicated or non-dedicated delivery of electronic book  
18 data. This signal may also provide for ordering access from the home system 1290 to the  
19 billing and collection system 278 or operations center 250, or the signal may be a means  
20 to provide access to the Internet or other public network through which electronic books  
21 are ordered and electronic book data is delivered. The wired data network 3001 can be  
22 metallic wire or fiber, supporting any of a number of communication standards including  
23 HDSL, ADSL, DSL, ISDN, T1, T3, SONET, ATM, X.25, frame relay, Switched  
24 MultiMegabit Data Service (SMDS), or others. The signal sent over the wired data  
25 network may be generated by a data modem or transmission device, in which the  
26 appropriate modem, interface device, or Data Terminating Equipment (DTE) device is  
27 used to receive the signal and provide the embedded electronic book data to the home  
28 system 1290 modular connector 700 for processing. Embodiments of such receiving  
29 devices are shown in Figure 30 as HDSL modem 3002, ADSL modem 3003, DSL



1 modem 3003, ISDN Terminal equipment (TE) device 3005, T1 Digital service unit  
2 (DSU) 3006, T3 DSU 3007, Fiber user network interface device (UNI) 3008, ATM UNI  
3 3009, X.25 DTE 3010, Frame relay assembler / disassembler (FRAD) 3011, and SMDS  
4 subscriber network interface device (SNI) 3012. Alternatively, the home system 1290  
5 may contain an internal modem or DTE 3013, which receives one or more signal types  
6 and provides the received signal with embedded electronic book data to the home system  
7 1290 modular connector 700 for processing. Finally, the home system 1290 may be  
8 attached to a wired LAN using a transceiver. In this embodiment, electronic book data  
9 may be delivered over the LAN at any time. One example of how this embodiment may  
10 be used is in a university environment where each student has an electronic book home  
11 subsystem attached to the LAN. Professors can then deliver textbooks and assignments  
12 to selective students. In each embodiment, the modular connector 700 provides the  
13 embedded electronic book data to the digital logic 609 for further processing.

14 Figure 31 presents embodiments associated with the delivery of electronic books  
15 using the public switched telephone network (PSTN) 3101 to a home system 1310.  
16 Electronic book data is encoded for delivery by the modular encoder 2541 and formatted  
17 and transmitted by the modular transmission subsystem 2542. The signal is delivered  
18 over the PSTN 3101. This signal may provide for ordering access from the home system  
19 1310 to the billing and collection system 278 or operations center 250, or the signal may  
20 be a means to provide access to the Internet or other public network through which  
21 electronic books are ordered and electronic book data is delivered. The signal sent over  
22 the PSTN may be generated by a data modem or transmission device, in which the  
23 appropriate modem 3102 is used to receive the signal and provide the embedded  
24 electronic book data to the home system 1310 modular connector 700 for processing.  
25 Alternatively, the home system 1310 may contain an internal modem 3103, which  
26 receives the signal and provides the received signal with embedded electronic book data  
27 to the home system 1310 modular connector 700 for processing. In each embodiment,  
28 the modular connector 700 provides the embedded electronic book data to the digital  
29 logic 609 for further processing.

Figure 32 presents embodiments associated with the delivery of electronic books using wireless personal communications system (PCS) 3201 to a home system 1310. Electronic book data is encoded for delivery by the modular encoder 2541 and formatted and transmitted by the modular transmission subsystem 2542. The signal is then delivered over the PCS network 3201. The wireless PCS system may be, for example, a wireless LAN, digital cellular telephony network, analog cellular telephony network, digital cellular radio system, analog cellular radio system, digital pager network, analog pager network, or Personal Communication Network (PCN). This signal may provide for the dedicated or non-dedicated delivery of electronic book data. This signal may also provide for ordering access from the home system 1320 to the billing and collection system 278 or operations center 250, or the signal may be a means to provide access to the Internet or other public network through which electronic books are ordered and electronic book data is delivered. A wireless PCS receiver 3202 is used to receive the signal and provide the embedded electronic book data to the home system 1320 modular connector 700 for processing. Alternatively, the home system 258 may contain an internal wireless PCS receiver 3203 which receives the signal and provides the received signal with embedded electronic book data to the home system 1320 modular connector 700 for processing. In each embodiment, the modular connector 700 provides the embedded electronic book data to the digital logic 609 for further processing.

Returning to Figure 19, several embodiments are shown associated with the delivery of electronic books using a national or local television broadcaster's signal. The signal from the national broadcaster 1110 can be delivered to the home subsystem 258', 285'', or 258''' using a satellite system 1122, using a broadcast affiliate 1112 terrestrially, or using a local cable system 1114. Alternatively, the local television broadcast affiliate 1112 can originate the signal which can be delivered to the home system 258', 258'' or 258''' terrestrially, or using a local cable system 1114. In one embodiment, the video signal is an analog video signal and the electronic book data is embedded in the video signal. In another embodiment, the video signal is a digital video signal and the electronic book data is carried as an independent data stream. In another embodiment,

1 electronic book data may be embedded within the audio signal. In one embodiment, the  
2 audio signal is an analog audio signal. In another embodiment, the audio signal is a  
3 digital audio signal.

4 In yet another embodiment, the signal is a spread spectrum signal containing a  
5 digital data stream, requiring an appropriate spread spectrum receiver modular connector,  
6 such as the connector 700 of Figure 32, in the home system 258', 258" or 258''' to extract  
7 the electronic book data for processing by the digital logic 609. In this embodiment, the  
8 spread spectrum signal is transmitted in the same bandwidth as the video or audio signal,  
9 but below the noise level.

10 Alternatively, several embodiments are associated with the delivery of electronic  
11 books using a national or local radio broadcaster's signal. The signal from the national  
12 radio broadcaster can be delivered to the home system 258', 258" or 258''' using the  
13 satellite system 1122, or using a broadcast affiliate 1122. Alternatively, the radio  
14 broadcast affiliate 1122 can originate the signal, which can be delivered to the home  
15 system 258', 258" or 258''', terrestrially. In one embodiment, the audio signal is an  
16 analog audio signal and the electronic book data is embedded in the audio signal. In  
17 another embodiment, the audio signal is a digital audio signal and the electronic book  
18 data is carried as an independent data stream. In yet another embodiment, the electronic  
19 book data is embedded in a sub-carrier of the analog audio broadcast. In a final  
20 embodiment, the signal is a spread spectrum signal containing a digital data stream,  
21 requiring an appropriate spread spectrum receiver modular connector 700 in the home  
22 system 258', 258", or 258''' to extract the electronic book data for processing by the  
23 digital logic 609. In this embodiment, the spread spectrum signal is transmitted in the  
24 same bandwidth as the audio signal, but below the noise level.

25 In any of the delivery methods above, the delivery path may be used to establish  
26 connectivity to the Internet, allowing Internet delivery of electronic book data as  
27 presented early in this section.

28 In an alternative delivery embodiment, the electronic book system can be  
29 modified, as was presented in Figure 15 and discussed above, to be used at public

1 libraries, schools, bookstores, newspaper stands or stand-alone kiosks, for example.  
2 Public newsstands for electronic books and periodicals may be conveniently located, such  
3 at the corner store on a New York City street corner, at an airport, or even on an airplane.  
4 The main unit at the public library, school, bookstore, newsstand, or kiosk may be the file  
5 server 900 as shown in Figure 15. The file server 900 is a large electronic memory unit  
6 that can store thousands of books, newspapers, or periodicals. Various electronic storage  
7 means may be used in the file servers, such as hard disks, read-write CD ROMs and read-  
8 only CD ROMs. The controller 908 in Figure 15 is able to download books to public  
9 viewers 912. The bookstores or libraries can rent the public viewer 912 to customers  
10 with the text for one or two books loaded onto the public viewer 912. Alternatively, the  
11 customer may own the viewer. The customer returns to the file server 900 from time to  
12 time to receive textual data for a book, which the customer can read and delete or store  
13 permanently on the customer's own home system 258. Based on the specific information  
14 known about a customer, advertisements contained in the electronic books may be  
15 customized, creating a unique version of the downloaded newspaper, magazine, or book  
16 for each customer.

17 Electronic book data also may be delivered as content stored on physical devices  
18 like a floppy disk, magnetic tape, Smart Card device, Memory Stick device, or any other  
19 portable memory storage device and provided to a subscriber for transfer to the home  
20 system 258. Each electronic book memory storage device can contain a unique identifier,  
21 one or more electronic book files, and associated viewing authorization information.  
22 Viewing of any electronic book file from the memory device may be supported without  
23 restriction. Alternatively, some or all electronic book files on the memory device may  
24 be available for limited viewing or may require authorization from the billing and  
25 collection system 278 prior to being viewed. In this case, the home system 258 may  
26 contact the billing and collection system 278 for authorization prior to viewing.

27 When the electronic book is delivered on a portable storage medium, such as the  
28 Smart Card device or the Memory Stick device, the electronic book and its storage  
29 medium may be packaged in a manner that protects the storage device, and also provides

1 a simulation of an actual book. Figure 33 is an example of a storage device 2600 that  
2 stores an electronic book portable storage medium. A Smart Card 2601 is held in place  
3 in a recess 2602 in a back panel 2603 of the storage device 2600. A front panel 2604 is  
4 attached to the back panel 2603 by a hinge 2605 that is placed at a back spine 2606 of the  
5 storage device 2600. The front panel 2604 may be operated to close over the back panel  
6 2603 to completely cover the storage medium 2601. The front panel 2604 may  
7 incorporate a clasp, or similar locking device, that engages a corresponding detent 2608  
8 in the back panel 2603 so as to securely close the storage device 2600.

9 The front panel 2604 of the storage device 2600 may include a cover 2609 that  
10 replicates a front cover, or dust jacket of a hard copy book corresponding to the electronic  
11 book. Similarly, the back panel 2603 may include a display similar to that existing on a  
12 back cover, or dust jacket of the corresponding hard copy book. A cover such as the  
13 cover 2609 may be a piece of paper or similar material that is inserted into the front panel  
14 2604, for example. Alternately, the cover 2609 may be a permanently fixed replication  
15 of the front cover of the corresponding hard copy book. The resulting storage device  
16 2600 may thus emulate the corresponding hard copy book, and may be stored on an actual  
17 bookshelf, or other storage area, in the same manner as the corresponding hard copy  
18 book.

19 Electronic book data may also be delivered from a machine or other device to the  
20 home system 258. Figure 34 shows a system 2700 of machines 2701 that are coupled by  
21 a communications network 2702. The communications network 2702 may be any wired  
22 or wireless system previously described herein. The communications network 2702 may  
23 also be an electrical distribution system, such as a home wiring system that is rated at 110  
24 and 220 volts, for example. The system 2700 may include an interface 2703 through  
25 which the viewer 266 communicates with the machines 2701. For example, the interface  
26 2703 may be a plug-in device that may be inserted into a 110-volt wall socket. Such a  
27 device 2703 may include a wired or wireless interface to the viewer 266.

28 The machines 2701 may include a microprocessor 2710, a memory 2711, and a  
29 transceiver 2712, which may be incorporated in VLSI, for example. Included in the

1 memory 2711 may be one or more electronic books that may be downloaded to the  
2 viewer 266, or otherwise viewed by the viewer 266 using the interface 2703. For  
3 example, a home appliance could include in its memory, an electronic technical manual  
4 related to the home appliance. To access the electronic technical manual, the viewer 266,  
5 through the interface 2703, may transmit a code or similar "handshake" to cause the  
6 microprocessor 2710 to transmit the electronic technical manual, using the transceiver  
7 2712, to the viewer 266.

8 The electronic book system 200 may also incorporate a book preview mechanism.  
9 Such a preview mechanism may provide the look and feel of browsing through a  
10 selection of books or magazines in a bookstore. Thus, the subscriber may browse  
11 electronic books, electronic magazines, and electronic newspapers, for example, before  
12 purchasing the electronic books, newspapers or magazines. Electronic book previews  
13 were previously described with respect to Figures 14i and 14j. Such electronic book  
14 previews may be provided as an on-line service, an off-line service, or both.

15 The on-line electronic book preview mechanism may use an Internet web site,  
16 such as the web site 279, to display electronic book previews. To obtain an electronic  
17 book preview, the subscriber may communicate with, or access, the web site 279 using  
18 the viewer 266, or one of the other devices shown in Figures 21a - 21g including the set  
19 top terminal 1220, the personal computer 1172 and the television 1171, for example.  
20 Once in communication with the Internet web site 279, the subscriber may select an  
21 electronic book preview to view from a list or menu, such as the menu 866 shown in  
22 Figure 13, for example, of available electronic book previews. The selected electronic  
23 book preview may then be displayed on a web page of the Internet web site 279, and may  
24 be viewed on the viewer, 266, the television 1171 or the personal computer 1172, for  
25 example.

26 Other on-line sites may be used to display electronic book previews. In general,  
27 any addressable node, such as an e-mail address, for example, in a telecommunications  
28 network may be used as a display site for electronic book previews.

1           The electronic book previews may also be provided off-line, to be downloaded  
2 to the home system 258, for example. The subscriber may access the Internet web site  
3 279 and download an electronic file that includes the electronic book preview. The  
4 electronic book preview may be stored in the library or the viewer, for example. The  
5 subscriber may then view the electronic book preview using the viewer 266, the  
6 television 1171, or the personal computer 1172, for example.

7           When the electronic book previews are provided for downloading to the home  
8 system 258, the electronic book previews may be provided in encrypted format or in  
9 unencrypted format.

10           The delivery methods discussed above that allow for dedicated, full time delivery  
11 can be used to provide continuous distribution of electronic book data including  
12 requested electronic books from subscribers, electronic books to be broadcast to all  
13 subscribers, updated menu contents, and updated advertising. For the delivery methods  
14 discussed above that allow for non-dedicated or user established connectivity, the  
15 operations center 250 may manage the timing and delivery of content by delivering the  
16 electronic book only when requested, or periodically, to ensure delivery for those home  
17 systems that may not be able to receive the delivery. Finally, the delivery methods  
18 discussed above that are capable of two-way communication may be used to provide a  
19 return path to the operations center 250 or billing and collection system 278 for the  
20 purpose of ordering or requesting updated electronic book information.

21           Additionally, although the home system 258 is presented as an independent device  
22 that directly interfaces with the delivery system 200, the home system 258 may connect  
23 to the delivery system 200 through a set top terminal, TV, PC, radio, or any other device  
24 capable of receiving the signal provided by the delivery system 200. Additionally, the  
25 home system 258 may not be an independent apparatus, having some or all of its  
26 functionality supported within the set top terminal, TV, PC, radio, or any other device  
27 capable of receiving the signal provided by the delivery system.

28 e.

1 f. Alternative Ordering Methods

2 Any of the delivery methods described in the section above are viable  
3 embodiments for providing access from the home system 258 to the billing and collection  
4 system 278 or operations center 250. In an embodiment, the modular connector 701, as  
5 shown in Figures 6b and 8, may be used to provide the specific protocol formatting and  
6 transmission processing to allow the home system 258 to use the communication path.  
7 In the embodiment where the PSTN is used to provide access, the modular connector 701  
8 includes the phone connector 270 and the modem 611 as depicted in Figure 6b. In the  
9 embodiment where the cellular phone system is used to provide access, the modular  
10 connector 701 includes the cellular phone or PCN phone 611' as depicted in Figure 6b.

11 g. Mobile Environments

12 A feature provided by the delivery methods using a wireless broadcast system  
13 2801, satellite broadcast system 2901, wireless personal communication system 3201, or  
14 terrestrial television broadcast system, is mobility of the electronic book home system or  
15 viewer 266. This mobility allows for ordering and receiving electronic book data anytime  
16 or anywhere, from sitting on a beach in Florida to sitting on a bus in New York City.  
17 This mobility allows for the delivery of electronic book data subscription products such  
18 as daily newspapers, monthly magazines, or books from book-of-the-month clubs. These  
19 subscription products may be delivered automatically to the appropriate home system 258  
20 or electronic book viewer 266. Enhanced end-to-end error correction techniques can be  
21 added to the transmission system to ensure higher probability of receipt for these mobile  
22 environments. Additionally, transmission methods may be implemented that resend  
23 packets of electronic book data, changing their delivered order on each resend, to improve  
24 likelihood of receipt. For lower bandwidth mobile environments, an electronic book file  
25 may be broken up into packets and the packets sent a limited number of times. If the  
26 electronic book file is not received completely, the electronic book viewer 266 may  
27 initiate a request to the operations center 250 to resend only that portion of the electronic  
28 book file yet to be received.



1           A variety of delivery mechanisms, systems and methods have been described for  
2 ordering and delivery of electronic books. One of ordinary skill in the art will recognize  
3 that the above description is that of preferred embodiments of the invention and that  
4 various changes and modifications may be made thereto without departing from the spirit  
5 and scope of the invention as defined in the following claims.

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